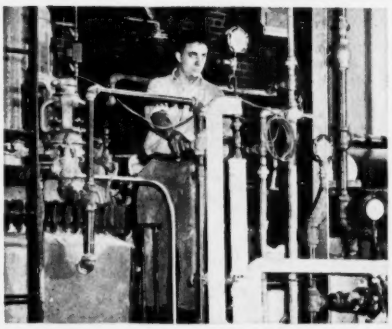
Chemical Week

February 9, 1952 Price 35 cents



The public's the boss; industry recognizes it, gets set to beef up friend-winning program . . . p. 11

CIO's Haywood spearheads drive to corral chemical workers; looming: inter-union fights . p. 14

What worries research execs? Here's CW's industry check . p. 26

CW Camera: Research and production put heads together; result: slick new process . . . . . p. 34

There's more fixed nitrogen capacity on the way; but it won't help today's pinch . . . . . p. 51

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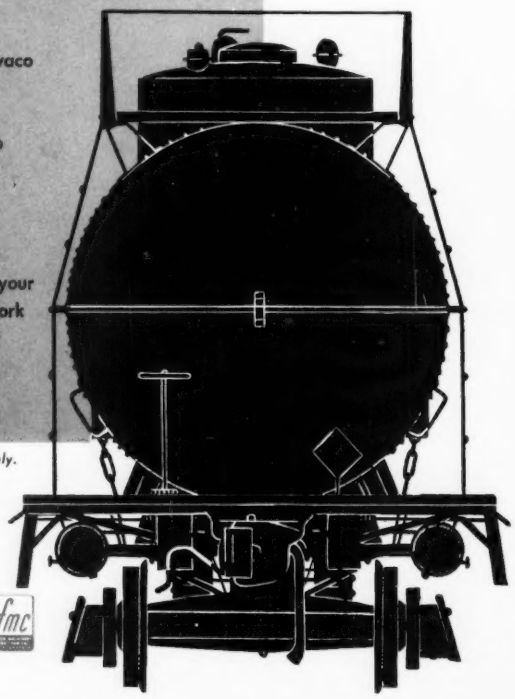

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Chemical Week

Volume 70 Number 6

February 9, 1952

OPINION	3
NEWSLETTER	7
BUSINESS & INDUSTRY	11
RESEARCH	26
PRODUCTION	34
SPECIALTIES	45
MARKETS	49
BOOKS	54
MEETINGS	54
BOOKLETS	56

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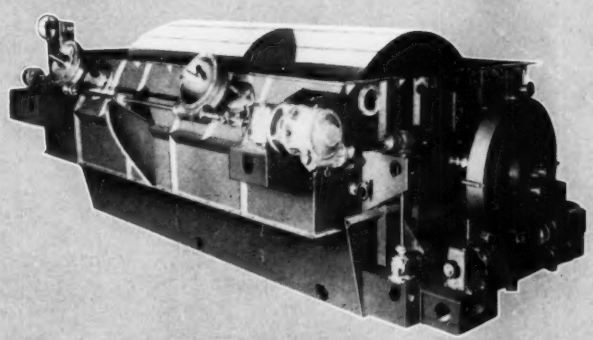

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CLOSURES

OPINION . . . . .

Add CMC to the List

To The Editor: We enjoyed your article, "Pedigreed Mud" (Dec. 22). The drilling mud industry is certainly a highly interesting field of application for a variety of chemicals, and seemingly a relatively neglected field in the chemical journals.

However, we were quite surprised and somewhat disappointed to see no mention of . . . sodium carboxymethylcellulose. The use of CMC in drilling operations has been one of the outstanding developments in recent mud technology.

CMC contributes these advantages to the drilling mud:

1. The viscosity of the mud . . . may be easily controlled . . .
2. Water loss from the mud may be sharply reduced . . .
3. Muds treated with CMC give a tough, thin filter cake.
4. As CMC is extremely difficult to hydrolyze, muds using this material are stable at the relatively high temperatures encountered at the bithead.
5. Muds containing CMC are stable to electrolytes . . .
6. Bentonite shows little tendency to swell in muds containing CMC.

Wyandotte, one of the principal producers of CMC in the United States, has just recently entered the drilling mud field with a type of CMC, known by our trade name as Carbose MX, which has been especially designed for this use.

We hope that this information will prove to be of interest to you.

J. L. Craig
Development Department
Wyandotte Chemical Corp.
Wyandotte, Mich.

True, Reader Craig. A newcomer to the field and still relatively small, CMC should nevertheless have been included as well as the special starches with which it—because of its greater versatility and stability—is an up-and-coming competitor.—Ed.

Seeming Paradox

To The Editor: I would like some clarification, if possible, on the article in the Nov. 24, 1951 issue (and subsequent issues of Chemical Week describing an alarming shortage of chemists and engineers.)

Personally I know of a handful of qualified chemists and chemical engineers who would be interested in employment in private industry at present, but are unable to locate satisfactory positions.

Do these articles exaggerate the "shortage," is the "shortage" for men with specific training and experience, is it restricted to certain sections of the country, or is there some other explanation for this seeming paradox?

If the situation is as serious as some of the articles in recent issues of your publication would indicate, I would be glad . . . to assist the prospective employers in filling any vacancies . . .

P. J. Karp
Brooklyn, N. Y.

All the facts we have at hand, Reader Karp, support the view that there's a serious shortage of qualified technical personnel—all kinds, all over the country. Engineers are in greatest demand, in areas of greatest expansion activity—but nowhere, to our knowledge, is there a surplus of technically trained people.

Perhaps the "seeming paradox" you discern stems from your or your friends' definition of "satisfactory positions." A glance at any want-ad section of a newspaper or scientific journal shows a high ratio of situations-open to situations-wanted ads. Still, it may be difficult to find in a specified locality a position requiring a specified combination of experience and training.—Ed.

Accept Facts, Act

To The Editor: I have read with interest the discussion (Threat from Abroad, Jan. 26) on the effects of imported products of cheap foreign labor on the scientific apparatus manufacturers.

The solution to the problem is not an easy one or it would have been carried out long ago. Protective tariffs and import licensing restrictions are artificial cures . . . would appear to be contrary to the over-all national interest in these times when it is to our advantage to strengthen the economies of friendly foreign nations.

Perhaps the best answer, as intimated in the article, is for the instrument manufacturer to accept the fact that there are certain fields in which he cannot compete on equal terms because of labor cost, and turn his attention to fields where such competition is non-existent.

There have been great strides made in the development of instruments based on new analytical methods for the research laboratories . . . there is room for much more improvement. But more important there is a golden opportunity open to carry these new

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OPINION . . . . . .

methods over into the chemical processing plant. The chemical industry is just beginning to realize the great advantages of process control by analytical methods.

In the field of process control American instrumentation has always been far advanced as a result of the very difference in labor cost that is under discussion. I feel sure that many similar fields remain to be exploited by an aggressive, research-minded, American instrument industry. Further, these areas are fruitful without the risky protection afforded by Governmental tariff arguments.

PAUL A. WILKS
Asst. Director Sales & Research
The Perkin-Elmer Corp.
Norwalk, Conn.

Top-Rung Aluminum

TO THE EDITOR: . . . I notice in your issue of Dec. 22nd a picture and caption describing the opening of the Kaiser Chalmette plant. . . .

May I say that your description of this 400,000,000 pound (eventually) per annum aluminum plant as the biggest of its kind in the world seems quite wide of the mark. . . . Our Alcan smelter at Arvida—one of four in Canada—is about double the size of the Chalmette plant. We have been turning out over 700,000,000 pounds per annum for a long time.

I suspect you meant that the Chalmette plant would be the biggest in the United States.

PAUL CLARK
Aluminum Company of Canada, Ltd.
Montreal, Canada

Right, Reader Clark. Largest in the U. S. it is, but out-ranked by the titanic (and low-cost production) operation at Arvida.—ED.

Forthright, Fair

TO THE EDITOR: . . . The fine article . . . entitled "Silage Saver" (Dec. 29) . . . fairly and impartially presents the true story of the development of sulphur dioxide silage treatment, and we very much appreciate your forthright fairness . . .

W. F. LUCKENBACH, JR.
Industrial Sales Department
Virginia Smelting Co.
West Norfolk, Va.

CW welcomes expressions of opinion from readers. The only requirements: that they be pertinent, as brief as possible.

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WRITE FOR TECHNICAL BULLETINS

AD·21

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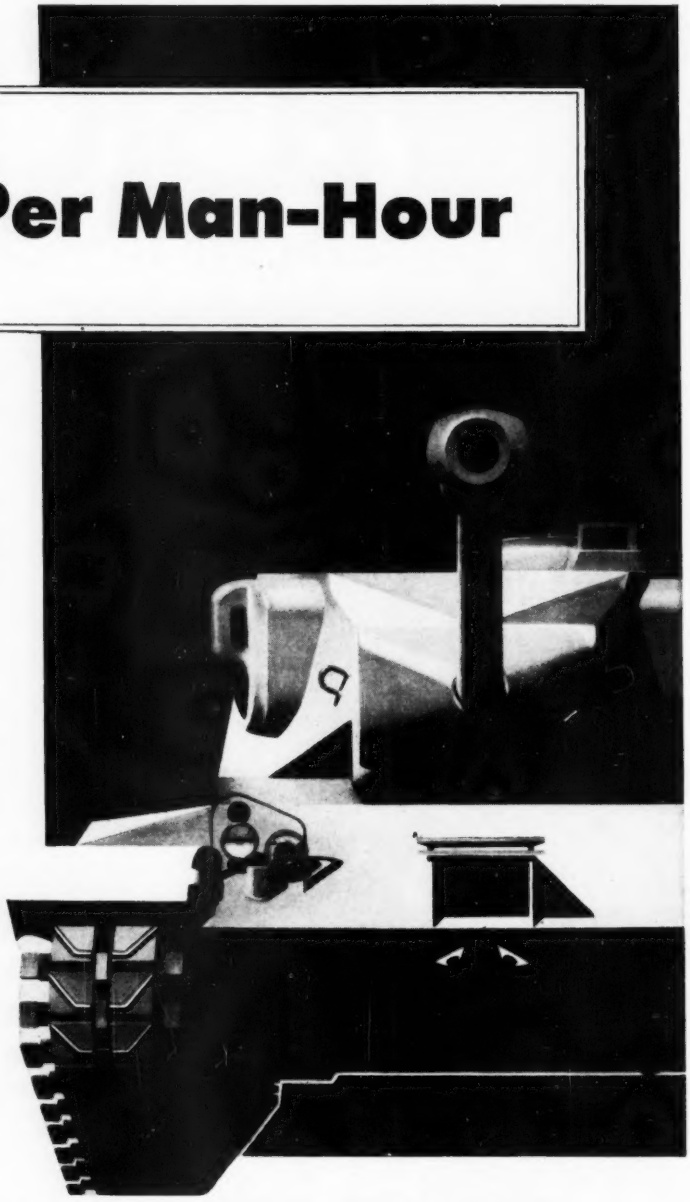

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NEWSLETTER

Secrecy bars will be lowered a notch next week. Press representatives will be allowed for the first time to bring their own cameras into Oak Ridge National Laboratory, see and photograph the nuclear reactor and other newly declassified areas. No security clearance is necessary either; U. S. citizenship is the only stipulation.

But like an iceberg, only a small part of it is visible. The vital, military phases are still behind locked and guarded doors.

You also have to be an American citizen to buy stock in Schering Corp., for which the Government is receiving bids until March 6.

But the Attorney General requires all bidders to answer a questionnaire by February 21. The twofold purpose: to make sure that the firm doesn't again fall into alien hands; to prevent acquisition under circumstances that would lessen competition in the pharmaceutical field.

"CBR" is a set of initials you may be hearing more and more. They're being used by military men in Washington to describe chemical-biological-radiological warfare—all of which, while different, employ similar techniques.

Chemical warfare is, of course, already well established (CW Newsletter, Jan 26); but the chemical process industries will be called upon increasingly as advances are made in the other two. "Other nations are investigating these fields," comments Chemical Corps research chief Brig. Gen. Creasy, "and we must assume that they are making progress."

Chemical expansion progress is again up against the perennial problem of inadequate steel. NPA had a tentative schedule for second-quarter steel allotments, discovered that the quantities set aside for civilian uses wouldn't enable continuation of projects that had already been given steel in prior quarters—and NPA had promised enough for those.

NPA has now asked the military services to trim the fat from their requests, hopes to turn a substantially higher quanity over to the Facilities and Construction Bureau for doling out among the various industry divisions—and thence to individual projects.

Another hot potato—synthetic fibers—is burning NPA's fingers. The politically potent National Cotton Council (farmers, ginners, warehousemen, merchants, spinners and converters) called upon NPA to withhold tax amortization benefits from synthetic fiber facilities.

DPA's soft answer: "National defense considerations will govern." It's a good bet, though, that DPA won't be "intimidated" by one segment of the textile industry; nor are the cotton interests in an irreproachable position to deplore the other fellow's "subsidy."

New England textile workers may get union help to stay put. One firm after another has moved to the South where taxes and labor are cheaper; but trucker and teamster unionists may—heeding a request from the textile unions—refuse to move mill machinery away from the area.

American Cyanamid's long-heralded synthetic acrylic fiber will be unveiled early next month.

One of the acrylic's major drawbacks so far has been lack of dyeability. Hence it's a good bet that Cyanamid thinks it has a better product from that aspect, to enter in the fiber derby.

A wide gulf separates the Bureau of Mines' and the National Petroleum Council's independent estimates of synthetic fuel production costs. Latest skirmish is NPC's interim report, which publicly calls the Bureau's figures misleading.

The Council some time ago asserted that synthetic gasoline would cost 43½¢ a gallon (CW, Nov. 17, '51). The Bureau of Mines took issue, claimed a cost at least 20% lower.

The Council now refutes the rebuttal, says the Bureau's study contributes nothing to indicate that the 43½¢ figure should be lowered. One of NPC's points: The Bureau's hypothetical "liquid fuels" plant would derive more than half its revenue from sale of chemicals—thus cannot be properly classified as a fuels venture.

New figures compiled by Continental Oil Co. outline the growth and present status of petrochemicals. In 1940 capital investment was $350 million, output was 4.1 billion lbs.; in 1945 corresponding figures were $1,200 million and 10½ billion lbs.; today they're $1,960 million and 16 billion lbs.

It's heartening not to be sold short by your own employees. Dow Chemical's workers had a chance to subscribe to 44,000 shares of stock, over-subscribed by 5,040 shares. Now the available shares will be prorated by lowering the maximum purchase to 9% (rather than 10%) of the individual's annual wages or salary.

Watch for new chemical methods of food preservation to come out of research being conducted by Eric Sharvelle and Joseph Vandermark at Purdue University under a grant from A&P.

One approach—useful for citrus fruits, tomatoes and other produce—is the use of chlorinated hydrocarbons, e.g., trichlorethylene. Another: antibiotics, like Imperial Chemical Industries' griseofulvin.

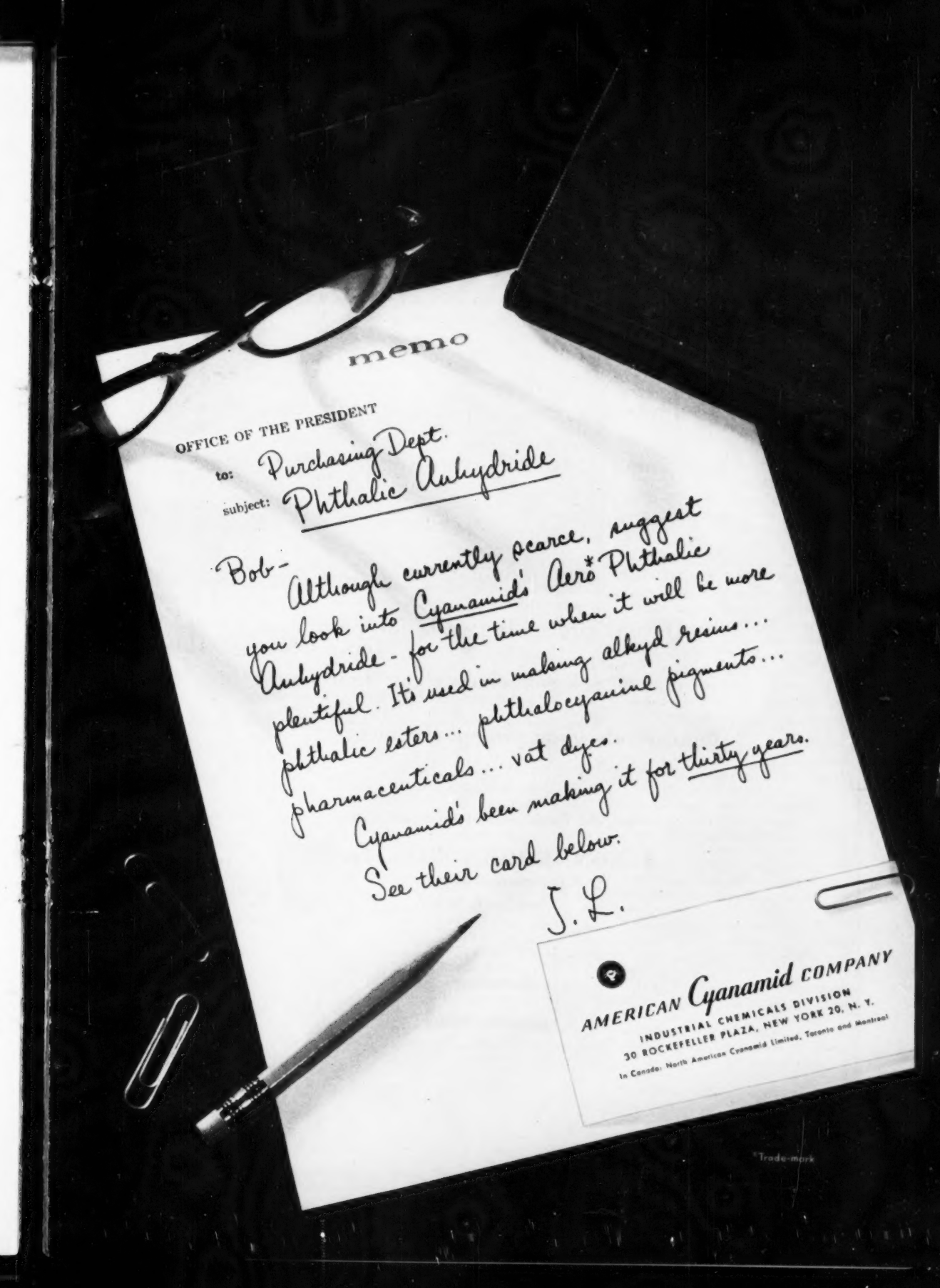
Chemicals were well represented in the latest record ($743 million) listing of DPA certificates: aniline, sulfuric acid, hydrofluoric acid and phthalic anhydride (Allied Chemical); oxygen, ethylene oxide and polyethylene (Union Carbide); phenol, sulfuric acid and phthalic anhydride (Monsanto); polyethylene (Du Pont); carbon bisulfide (Stauffer).

Election-year politics may force unwilling Congressmen to go along with the Humphrey bill, which would fasten more Government regulation on industry. The bill would set up a Federal factory inspection service to improve health and safety. Both Labor and Public Health would like to run it; but a separate agency may be set up to employ 5,000 inspectors, spend an estimated $50 million a year.

The Federal Trade Commission says it's not true that cigarettes containing diethylene glycol are less irritating than those made with glycerine—and has ordered Philip Morris to stop claiming so.

Says the Commission: All vegetable materials pyrolize to acrolein, the 3.65% glycerine in cigarettes makes no significant difference.

. . . The Editors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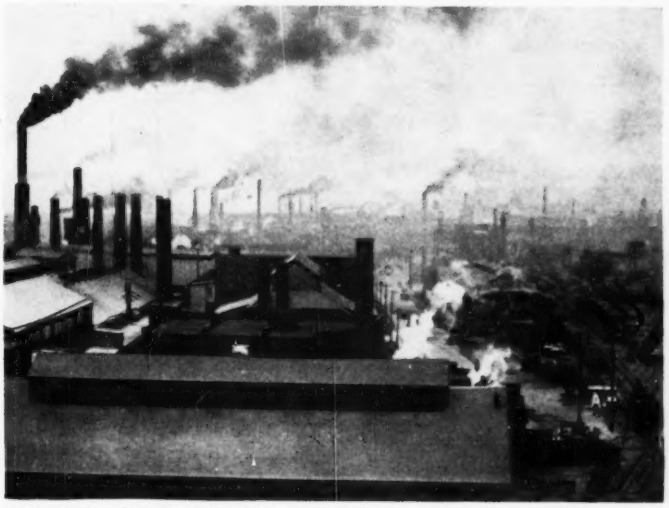


CHEMICAL PROCESS PLANTS: To clear the air, industry action, public approval.

Telling the Story

Public relations—being good and getting credit for it—is the No. 1 job of the chemical process industries this year.

Manufacturing Chemists' Association recognizes the problem with a four-point industry-wide program. But the payoff is what the individual company does.

In Philadelphia last week, police were confiscating novelty pills containing sodium formaldehyde sulfoxylate, a poison, which retailers were selling illegally to children. These Fourth of July specialties form a serpent-like ash when lit, but according to the city chemist, if swallowed, could kill a child instantly.

This week in Chicago, *Herald-American* readers were up in arms. In a front page feature, the paper had told of meat containing "a chemical, sodium sulfite," added as a preservative in violation of food laws.

Any day in the week, a radio commercial warns housewives not to use "chemicals," to rely on soap.

These three isolated examples of newspaper and advertising enterprise on the surface don't seem to be of vital concern to the chemical process industries. But actually they underscore one of the CPI's basic problems: The word "chemical" is still an emotional one to the public; it connotes stinks, poison, danger, mystery. While it evokes interest and wonder, it also arouses distrust and alarm.

And fringe operators in any field of chemical manufacture can bring discredit upon responsible firms.

Late Awakening: Last year, the industries, badgered by public distrust and ignorance of chemicals, formally recognized the situation for what it is: Making caustic soda, alcohol, fertilizers, etc. efficiently in one's own plant is not all there is to operating a chemical business.

A company can't succeed without public acceptance of its plants, its policies, its products, they realized. The public must know what a plant is making, what benefit it derives from this activity, and what care the manufacturer takes in his operations.

MCA raised $170,000 as a starting fund for public relations (*CW, Dec. 22*), has begun a 4-point program:

• Chemicals in foods. It held an inter-industry conference last month (*CW, Jan. 19*), offered a legislative recommendation based on an 18-month survey of the situation. Now it is preparing a booklet detailing tests companies make prior to marketing chemicals for foods, also stressing the positive benefits from their use.

• Chemicals for defense. Some Washington officials can't understand how a chemical like nitric acid, for example, fits into the defense picture. The end products aren't as easily traceable back to the raw material as in the case of, say, an airplane and aluminum. Such lack of technical knowledge has made procurement of steel and other tight essentials difficult for chemical makers.

MCA's current action: a booklet for general circulation, background memos for national newspapers and magazines and for the local press in war production centers.

• Chemicals as a career. Tackling the technical manpower shortage at the source, member firms will tell young people, teacher associations, community groups about industry contributions, its workings and opportunities for employment and service.

• Air and water pollution. Two of MCA's most active committees have worked a number of years to arouse CPI interest in this, and to exchange technical information.

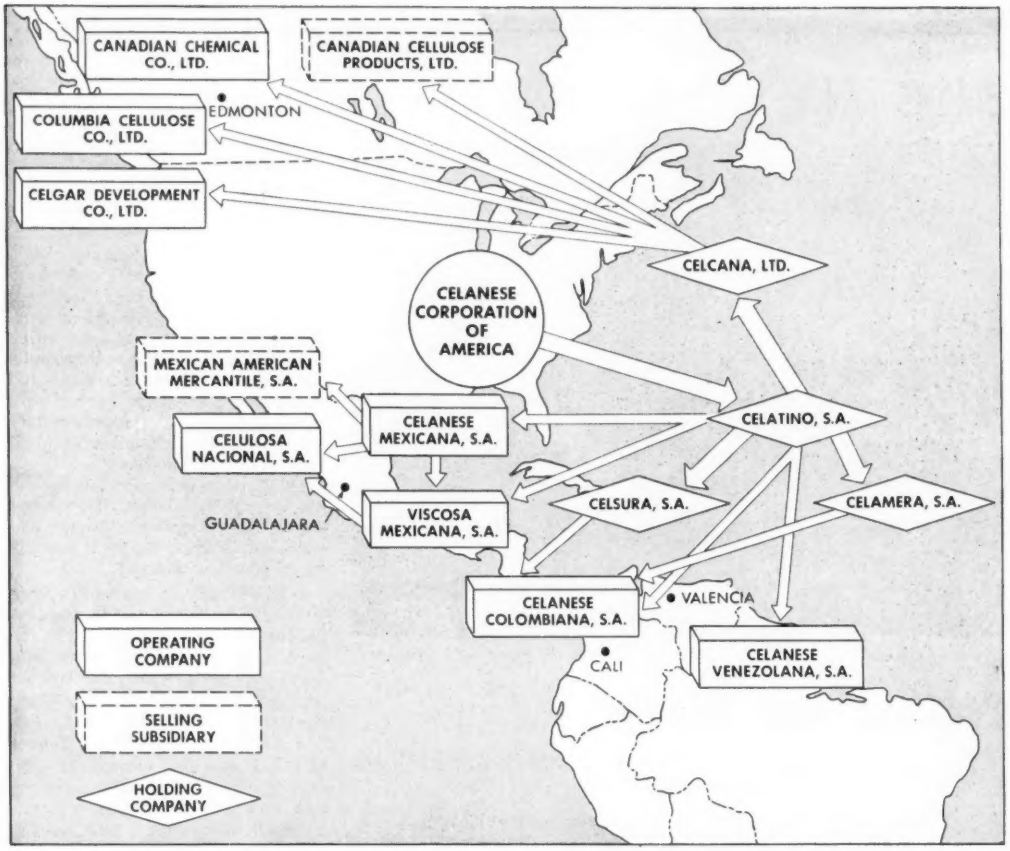
But the public doesn't know that the industry is doing much to correct and prevent pollution. At the coming Air Pollution Conference (Feb. 25-26), however, member expenditures and progress will be detailed.

On the Home Front: Most industry executives are behind the MCA move to spread enlightenment about the CPI. Nevertheless they caution that articles in papers must be matched by performance in plant towns.

Basically, the challenge is to be an asset to the city and country, running a plant that workers and townspeople brag about.

Most chemical companies and plants are in that category. Some 20-25, for example, in the last five years have spent $19 million on added facilities to control air pollution alone, pay a bill of $5 million a year to operate them. And in the past few months, three company boards refused to approve plans for new plants. Reason: No air pollution controls.

Getting credit for such foresight is good business and good public relations. And it will help remove "chemicals" from the realm of necromancy.



Integration: Forest to Filament

Celanese Corp.'s recent formation in Canada of Celgar Development Co. to mother a $65 million woodpulp and newsprint program in southeastern British Columbia (CW, Jan. 19) is the company's third major Canadian step in its "integration backward to raw materials."

Integrating backwards, upwards or downwards, this last phase will bring Celanese's Canadian holdings to a $157 million grand total. Of this its recently completed cellulose mill (Columbia Cellulose Co.) has accounted for more than $31 million, its soon-to-be completed Canadian Chemical Co. integrated petrochemical and filament yarn and staple plant, another $61 million.

But the Canadian venture simply caps Celanese efforts to boost its cellulose acetate filament and staple fiber business in the Western Hemisphere: Domestically the company has acquired six plants and two laboratories since 1945, and one plant (a $19 million petrochemical installation at Pampa, Texas) is under construction.

The Pampa plant will bring the number of U.S. petrochemical, plastics filament and sheet, cellulose acetate filament and staple fiber, viscose, and fabric producing plants owned by Celanese and its domestic subsidiaries to thirteen.

South American Way: In Mexico, subsidiary Celanese Mexicana has an acetate and staple fiber plant near Guadalajara; Viscosa Mexicana, a viscose yarn and staple fiber plant at Zacapu near Mexico City. Subsidiaries of these two subsidiaries—Celulosa Nacional and Claracel,* S.A.—have units just coming into production; a cellulose pulping plant at Rio Bravo on the Texas border, and a plastics plant in Mexico City, respectively.

* Information on Claracel does not appear on accompanying map.

There are also two other subsidiaries on the coast of South America: Celanese Columbiana, S.A. has begun operation of an acetate filament yarn plant near Cali, Colombia; and Celanese Venezolana, S.A. is currently constructing an acetate filament yarn and staple fiber factory near Valencia, Venezuela. Plants in other South American countries could conceivably be in the offing.

In Hand: But of special interest are the holding companies Celanese has founded to handle its Western Hemisphere activities. *(See chart.)* The Canadian companies (Canadian Chemical, Columbia Cellulose, Canadian Cellulose Products, and Celgar) are held, for example, by Celcana, Ltd. which in turn is held by another holding company, Celatino, S.A., all of whose stock is controlled by Celanese.

But Celatino also holds holding companies Celsura, S.A., and Celamera, S.A., which in turn help it hold

51% of the stock in Celanese Colombiana, S.A.*

Celatino also hold 50% of Celanese Venezolana stock and has control of Celanese Mexicana. Celanese Mexicana shares with Mexican interests direction of Viscosa Mexicana, owns selling company Mexican American Mercantile, and, in partnership with Viscosa Mexicana, controls Celulosa Nacional and Claracel.

Bonded Burden: Vying with recent reports of new Celanese expansion in Canada and elsewhere has been the corporation's great money raising efforts.

Betting on the current and future popularity of cellulose acetate fibers and petrochemicals the domestic company has taken on during the last few years a total bonded debt approaching $100 million. In addition the Canadian affiliates have additional bonded debt of $67 million.

Recent examples: the $50 million domestic offering of 3½ debentures issued in the U.S. last October. This followed hard on the heels of the $43 million in mortgage bonds sold by Canadian Chemical to help finance its Edmonton plant.

Swelling the total is $1.5 million outstanding in bonds for Celanese Mexicana, more than $3 million for Viscosa Mexicana. And of course, if past performance is any indication, once the Celgar Development Co.'s $65 million forest products—newsprint project gets under way,† over-all bonded indebtedness can be expected to jump accordingly.

In the case of the parent company alone, sinking funds and interest charges eat away more than $5½ million annually. This total (calculated on the domestic corporation's current bonded debt load) is due to be boosted to $7 million annually on or about June, 1957.

These figures do not look so bad against the $83 million net operating income the company stacked up in 1950 (a record year for synthetic fiber sales) but in 1951, at the third quarter mark, net income was $8½ million behind third quarter '50 figures. Moreover, the textile business has worsened since.

Further Stake: In addition to its bonded indebtedness, Celanese Corp. of America has made certain agreements with its Canadian subsidiaries to bolster the sale of Canadian bonds:

It is obligated "to purchase or cause to be purchased" the full production of the Columbia Cellulose Co.'s cellulose plant up to 200 tons per day at a going price of $225 per ton—a commitment in excess of $14.5 million annually.

In addition, it has agreed to take almost the entire output of the Edmonton plant (less petrochemicals): 9 million lbs. of staple fiber at current market prices less 5% (more than $4 million at current quotes); 4½ million lbs. of filament yarn (a bill of $3 million plus); and 10 million lbs. of acetate flake (roughly $4 million). All this the American company would use in its own operations or sell on the open market.

But that isn't all. Celanese has also promised to supply the Edmonton project with $10 million more, if necessary, and "to subscribe or cause to be subscribed" $15 million in preferred and common shares. It has already purchased $5 million in common as of last July.

The total of the parent company's actual and potential Canadian commitments amounts to this $25 million plus the additional guarantee of $25.5 million yearly for the Canadian affiliate's production. And Celgar could add to this.

Couple all this—the Canadian commitments, the parent company's weight of bonded debt—with the fact that Celanese at present is largely a one-fiber company, and you have a condition that could, in unfavorable times, become precarious.

The Other Side: But there is another side to the story. Company officials have complete faith in present and future markets for Celanese acetate filament and staple yarn, in its lesser viscose operations, and in its future position as a supplier of newsprint and kraft, and such petrochemicals as methanol and formaldehyde.

They stress the phenomenal growth of synthetic fiber consumption over the last few years (a leap from some ¼ billion lbs. in 1935 to almost 1.4 billion lbs. in 1950). Shipments of acetate filament and staple fiber, they say, were over 443 million lbs. in 1950, more than half of which Celanese supplied*.

Last year estimated total shipments (because of the slump in textiles generally) did not top the 400 million lb. mark, but even this figure is ahead of 1949's 377 million lbs.

And synthetics took current textile sales drop much better than natural fibers. Reason: Cellulose acetate and other man-made fibers grabbed a sizable slice of last year's high priced wool market, will undoubtedly hold on to new found uses in rugs and suitings.

As for the Canadian operations, management points out that once its projects there are well under way, Canadian investors will be invited to take over part ownership. This could mean possible early retirement of the current bonded debt.

Moreover, Celanese says that Canadian Chemical will have a husky petrochemical project at Edmonton. Taking advantage of nearby Alberta petroleum, it will provide Canadian industry with its first domestic supply of pentaerythritol, methanol, n-propanol, isobutanol and n-propyl acetate.

The company holds up Celanese operations in South America as a prime example of its willingness to share ownership with local investors. (But of course, this is required by law south of the border.)

South America is more than a model for Canadian operations, however. Its rapidly expanding viscose and acetate market should help absorb any excess Canadian output:

- In 1946 Mexican domestic production of rayon and acetate fiber totaled 550,000 lbs.; in 1951, 22.5 million lbs. Consumption in 1952 is estimated at about 32 million lbs., virtually all of which Celanese anticipates supplying.

- In Colombia, Celanese Colombiana is expected to produce 17½ million lbs. of filament yarn for local consumption, and Venezuela is expected to gobble up more than 6 million lbs. of Celanese Venezolana's output annually. And to Celanese management, fields elsewhere in South and Central America look just as green.

Calculated Risk: It looks as though company management has decided on a calculated risk. If foreign and domestic markets hold and continue to expand, the corporation and its affiliates will certainly be able to pull their present weight of bonded debt and more, with consequent reward to the company's more than 34,000 stockholders. (Current annual dividend: $3½ per share of common stock).

But it is none the less true that the textile business has a reputation for being skittish, and as things now stand Celanese eggs are almost all in one basket.

The company believes, however, that its Western Hemisphere "integration backward" to raw materials and forward to expanded markets will ultimately strengthen its position.

* In Colombia no one company can hold 51% of the stock of another company, so Celanese is forced to use this complicated holding-company device.

† Celgar is currently waiting for its Forest Management License to be granted before developing a 500-acre plant site three miles west of Castlegar.

* Other U.S. producers: Du Pont, Tennessee Eastman, American Viscose.

Organize The Unorganized

CIO's Gas, Coke & Chemical Workers Union is ready to fire the first gun in its most ambitious organizing drive.

Higher wages, more fringe benefits, are also high on the union's list of targets for 1952.

Hard hit by jurisdictional troubles, the union's Executive Board has taken the first step in its campaign to block other CIO unions from the chemical industry.

1952 will see the most intensive, comprehensive, and far-reaching organizational drive ever attempted by CIO's Gas, Coke & Chemical Workers. That is the word from the union's International Executive Board meeting held recently in Washington, D.C.

Robert C. Edwards, director of organization, pointed out that the ambitious campaign is designed to match the rapidly growing chemical industry step for step; to organize plants as they are built.

Gas, Coke & Chemical's drive is getting the full backing of the national CIO, even to the parent body's supplying additional organizing personnel and assistance to the tune of $10,000 a month. In turn, the union itself has increased the funds allocated for organizational purpose by more than 40%.

Wide Awake: Since September, 1950, the CIO union, under the leadership of its active president Martin Wagner, claims to have won elections involving some 20,000 workers in the gas, coke and chemical industries. This was accomplished with the organization of 69 new plants in that period.

Although the union would not reveal any details of its plans—for "security reasons" it said, meaning security from company antagonism—it is safe to assume that the campaign now in progress at the Badger Ordnance Works in Wisconsin is typical of what will be done more widely in the near future.

WAGNER: In a "growth" industry, union membership must grow with it.

Direct Mail: While going all-out to organize, the union is not sitting still where present contracts are concerned. The Board authorized the sending of letters to all companies under contract with the union asking for details of wage increases, including fringe benefits, granted since the first pay period following Jan. 15, 1950. Under NLRB and court decisions, companies are required to provide such information to unions upon request.

At the same time, the union is planning to do all it can to obtain the maximum in fringe benefits. Lack of expert assistance in such matters can make negotiations on a local level rather difficult. Now the union has hired the Employees Insurance Service Co., Huntington, W. Va., to act as consultants, and assist local unions with welfare and various other types of insurance during contract negotiations. The international leadership thinks emphasis on fringe benefits will help get even more new members.

Schooling Too: Still with a weather eye on more members, the union is sponsoring a Labor Institute to be conducted exclusively for its own members by the Labor Education Service of Penn State College. Better locals can get more results, and more results mean more members, reason Gas, Coke's leaders. Therefore courses will include such things as local union administration, grievance handling, wage rate problems, union counseling, human relations, workman's compensation and safety, and the role of labor in a defense economy.

In an effort to tighten its organizational setup in the Southwest, the Board authorized the executive officers to make a study of district boundaries in that area to see if the facts warranted District 8's leader, Joseph Appelbaum, suggesting a new district there.

HAYWOOD: Gets new "hot potato"—jurisdiction—in his lap.

Jurisdictional Trouble: Gas, Coke & Chemical is one of the hardest hit of CIO unions by what it considers invasions of its jurisdiction. The chemical industry is broad and comprehensive, and there are, possibly, more rival unions in it than any other single industry. Not only does Gas, Coke have to worry about International Chemical (AFL), District 50 (UMW), and Mine-Mill, but its own brother Steelworkers, Oilworkers, Ceramic and Sandworkers, and Rubber Workers.

The Oilworkers have been particularly active in Gas, Coke's basic jurisdiction. Confining their initial efforts to such Oilworker strongholds as Texas, they recently moved into Michigan and Gas, Coke is readying for battle with its ambitious brother.

As a result Gas, Coke has been a vociferous exponent of setting up machinery to handle jurisdictional disputes, at least within the CIO itself. Now that such a setup is in existence, the union is taking immediate advantage of it to present some of its grievances. As a first step, the Board prepared a letter to CIO Organizational Director Allan Haywood bringing to his attention some of the infringement incidents claimed by Gas, Coke.

The union is militant about defending its jurisdiction in the chemical and allied industries to the utmost, has every intention of resisting all attempts by other unions to organize in what it considers to be its sphere. This could mean trouble, if the CIO's new machinery breaks down before it really gets under way. Gas, Coke is out to buck some "big brothers," and anything can happen.

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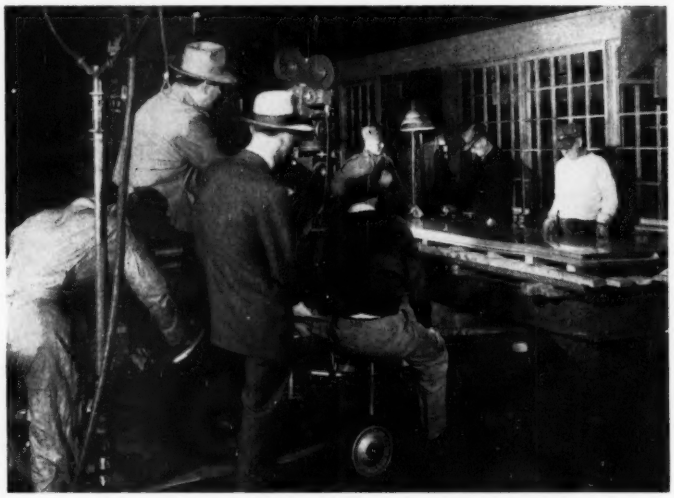

COMPANY MOVIES: To spread the word, a picture.

Selling With Celluloid

Chemical companies join swing to self-sponsored films to sell themselves, their industry, their products, and to train employees. Average production cost runs $25,000-50,000, but it can go much higher. Most films are distributed widely to interested groups, are inexpensive and effective sales tools.

The film that probably comes to mind first is the colossal (for the specialized business movie industry) *The Du Pont Story*, which cost in the neighborhood of $450,000 to produce, exclusive of prints. Here Du Pont reviews its philosophy, traditions and growth, depicts the development of such products as "soda powder," nylon, rayon, cellophane and Duco lacquers.

Longer than most such movies (1 hr. 12 min.), it is aimed at giving the employee a picture of the company and industry of which he is a part. However, like many others, it doubles as an "institutional" educational service, and is freely distributed to clubs, educational organizations, churches, labor unions and the like.

Du Pont has 150 prints of the film, is turning out 500 prints of a shorter (40 min.) version. The company hopes to reach an audience of eight million in the first three years the picture is shown, fifteen million in five. It will entertain them with the history of the company, its policies and its products at an ultimate cost of five cents per person.

Few Cents a Head: That cost—a nickel—is probably high compared with less elaborate productions, but it is still relatively cheap for 40 minutes of a viewer's time. It explains why more industrial companies* are turning to self-sponsored films to keep their names and products before the public, or selected portions of it.

Chemical manufacturers are about average in their exploitation of this medium, considerably behind such outstanding advocates as their fellows in the chemical process industries—the petroleum companies—and the auto makers. The pharmaceutical houses, however, have always relied on films of an ethical nature, designed for use before doctors, nurses, students and the like, and their constant output of new products has kept reels winding.

In the agricultural chemicals field, movies for grange members, extension station directors and other agricultural advisors can help put over a new product. Monsanto has just shot one on its new soil conditioner, Krilium, but it can't serve too wide an audience† yet. Showing a movie on the use of its Herbicidal Oil #1 was a big part of Lion Oil's introductory program for the product (*CW, Aug. 18*). And Hercules will soon be distributing its latest production, *Cotton Insectides and Their Control*, to agricultural extension stations throughout the cotton belt.

The latter, except for a credit "made

*Audiences at business-backed pictures are estimated at 20 million weekly, an increase of about one-third over last year.

†However, it was shown a week ago to science classes in St. Louis schools via television, an outlet many companies are eyeing to reach even bigger audiences at less expense.

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Have you recently studied the advantages in changing from 50% liquid caustic soda to 73%? A number of Columbia-Southern customers have made the change and in every instance the results have proved conclusive: A HIGH PROFIT RETURN ON EVERY CARLOAD OF 73% CONSUMED.

Here's an actual case study of three typical Columbia-Southern customers who made the change.

Customer	Cost of 50% liquid	Cost of 73% liquid	Per Cent of Savings	Total $ Savings per year	Cost of equipment and installation necessary to effect such savings	Return on Investment First Year
A	$ 68,240	$ 65,390	4.2%	$ 2,850	$2,650	108%
B	704,600	669,500	5%	35,100	3,500	1003%
C	171,800	164,500	4.3%	7,300	2,055	355%

Cost figures are based on market prices and freight rates effective January 1, 1952

As you will note from the study, the cost of the equipment and installation necessary for this profitable changeover is more than offset by the first year's savings. The small investment earns big dividends.

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with the cooperation of Hercules Powder Co.," does not mention the company nor its cotton insecticide toxaphene; it shows farmers how to recognize insects, infected plants, etc., and how to control them with organic insecticides.

Hercules apparently feels toxaphene is well enough known by prospective audiences, is performing this service for the consumers and consumers-to-be of its and other companies' products, but undoubtedly will gain the good will of agricultural groups. The company did a similar job with the six-month-old movie on hot-spray lacquer that explains how to apply such coatings, indirectly builds a demand for its nitrocellulose.

Better for Customers: Because chemical processes do not lend themselves as readily to exposition by movies as do mechanical operations, most "how to do it" films are beamed at users of the industry's products. Here are some illustrative productions:

Chemical Weed Control (Dow), methods of applying herbicides in control of major crops.

The Working of Magnesium (Dow), techniques for machining, forming, painting, etc. magnesium.

Fighting Fire with Wetter Water (Carbide), to promote Unox penetrant among fire control people.

Eyes of Flight (Rohm & Haas), just completed, to instruct Air Force and Navy maintenance men in care of Plexiglas parts of airplanes.

Drake Joins OPS

WILLIAM P. DRAKE, vice president in charge of sales, Pennsylvania Salt Mfg. Co., is to be OPS rubber, chemicals and drugs division director. He replaces Thomas H. McCormack who will return to Du Pont's Grasselli Chemicals Division.

Films covering company processes and products, however, are used in giving employees a general background, or specific information on departments other than their own. Many of these employee indoctrination or instruction movies double as public relations tools among consuming industries or the general public, are shown to plant communities, civic groups, scientific societies, high school or college technical students. Some titles:

Figures of Quality (Hercules), part quality control in synthetic resin production plays in insuring high standard materials.

Good Company (Cabot Carbon Co.), raw materials and processes of the industry, uses of carbon black, working conditions at Texas plant and company policies.

Growth Industry (Snow Crop), frozen foods.

Portrait of an Industry (Calco), processes in color production, including applications in industrial and household products.

Dow in Texas, produced last year to show company operations in Texas, but now banned because of Government security regulations.

Air, Water and Industry (Dow), how the company met industrial pollution problem at Midland plant.

Meet Monsanto, now being revised to include new president, Charles Thomas.

Little Hollywood: Turning out most of these films are about a hundred organizations scattered throughout the country. Greatest concentration of the bigger producers is in New York (Audio Productions, MPO Productions, Caravel Films, Sound Masters, Fordel Film Labs, March of Time, Pathescope), but probably the two biggest are headquartered in Chicago (Wilding Picture Productions) and Detroit (Jam Handy). Other important factors are Hollywood's Apex Film Corp., which made *The Du Pont Story*, Jerry Fairbanks Productions and Wolff Studios; Cleveland's Escar Motion Picture Services; Beverly Hills' Roland Reed Productions; and Oak Park, Ill.'s Atlas Film Corp.

Films can be black-and-white or colored, generally have sound, come in 16-mm. or 35-mm. sizes. A black-and-white can be made for as little as $5,000, but the average strip runs a little over twenty minutes, probably has color, and costs about $35,000.

Some companies may shoot their own films on occasion, or take some footage to be incorporated into a

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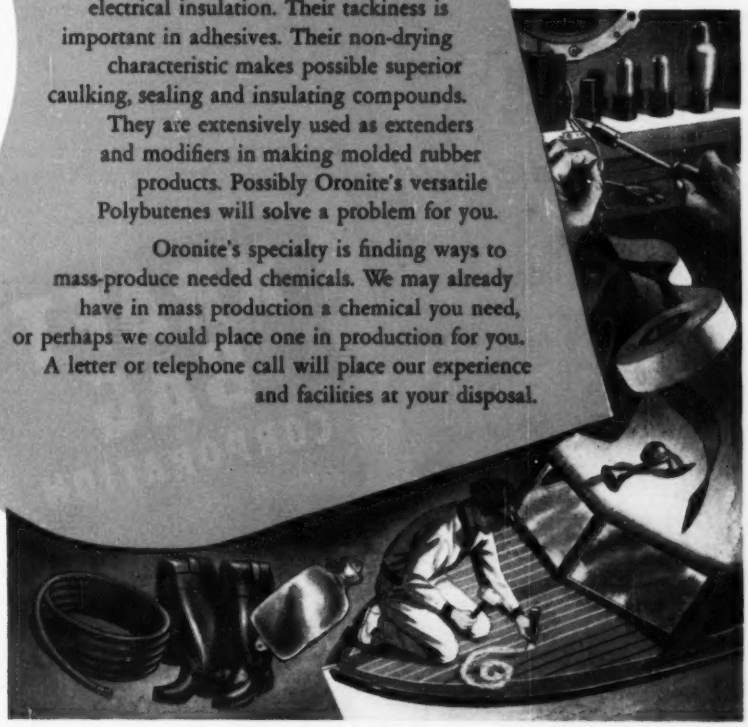

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movie made by an outside company. Monsanto's head of photography, Bill Woeger, for example, turns out a "company newsreel" that is shown at stockholders' meetings, to company employees, and to some outside groups.

But whatever the source, the cost of such productions is a small part of advertising and promotion budgets. Though the absolute return to the organization is hard to measure, those who advocate movies—and the number is increasing—consider them one of the most effective and inexpensive means to spread the word about their companies.

No Conspiracy

The Government lost its case against Ernest K. Halbach last week, when the 69-year-old executive was found innocent of violating the Sherman Anti-Trust Act and the Wilson Tariff Laws. The jury took ten hours to acquit the former president of General Dyestuff Corp. of Government charges that he had conspired to divide world markets in a cartel agreement with I. G. Farbenindustrie, A. G.

The Government apparently failed to convince the jurors that General Dyestuff Corp., under Halbach's direction, showed the conspiratorial nature of its agreement with I. G. Farben by continuing it after 1939. Prior to 1939 I. G. Farben had 85% of the South American market, the Government claimed, and when it was unable to supply this market, General Dyestuff took over and sold exclusively to Farben agents.

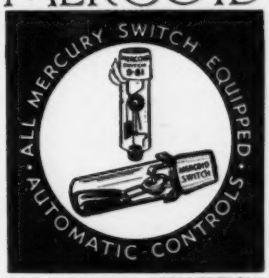
This, the Government alleged, was done to protect Farben's market, which was to be returned to it after the war. But the jurors obviously preferred to believe Halbach when he insisted that his corporation had not limited its sales to the German company's agents, but sold to anyone interested in its products.

Nolo Contendere: Halbach was originally indicted with General Dyestuff, General Aniline & Film Corp., and I. G. Farben in the alleged conspiracy to divide the world dyestuffs market. At that time Farben was said to have agreements in writing with both corporations to that effect.

Neither General Dyestuff nor GAF were involved in the decision.

Both companies were seized by the Alien Property Custodian during the war, and are still in Government hands. In 1950 they both entered pleas of *nolo contendere*, were fined $2,300 apiece.

MERCOID



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Non-Ferrous Metals Pinch

THE TRADITIONAL NEED FOR IMPORTS to supply Western Europe's consumption of such nonferrous metals as aluminum, copper, zinc, lead, nickel, and tin has been greatly increased by defense programs and strategic stockpiling. To enable such countries as France to produce their needed copper sulfate, it has been necessary to furnish copper by import under the Marshall Plan. So acute is the shortage that civilian consumption of nonferrous metals will be completely banned in the near future.

LABOR . . . . . .

Apprentice Deferment: Draft boards will be able to defer apprentice under an order issued last week by President Truman. The plan has been approved by the U.S. Bureau of Apprenticeship and other interested agencies as a means of easing the worsening critical shortage of skilled workers (*CW, Jan. 5*).

Deferment will not be automatic. Local boards will still have discretion, and minimum standards will be set to guide their actions. The worker will have to be in an approved apprenticeship program, and in training for a skilled job for at least a year, unless the trade is on the Labor Dept.'s list of "critical occupations."

•

International Nickel: The two big locals of the International Union of Mine, Mill, and Smelter Workers at International Nickel's Sudbury, Ont., and Port Colborne, Ont., plants brought their wage increases for the year to 30½-to-32½¢ an hour with a recent interim hike of 5½¢.

Wage rates at Sudbury are now $1.71½ to $2.01½ an hour, and similar wages prevail at Port Colborne. Wage negotiations, and other matters, will come up again soon for the 15,000 workers in the two plants when talks open on the 1952 contract in early April.

The ink was hardly dry on these INCO contracts when Mine-Mill got a similar agreement for its 1,700 workers at Falconbridge Nickel Co. and Canadian Industries Ltd.

•

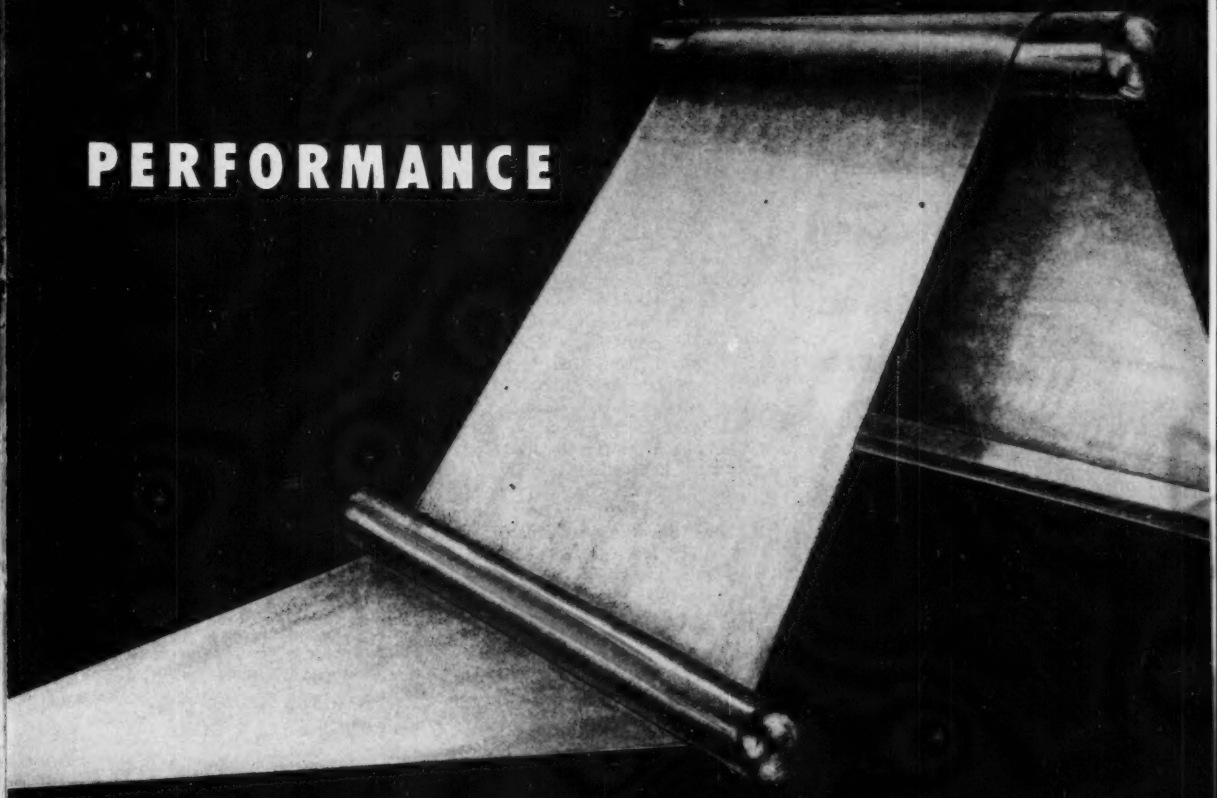
Teamsters Lose: In a recent election at Whitehall Pharmacal Company, Elkhart, Ind., the Gas, Coke & Chemical Workers (CIO) took the plant from the AFL Teamsters. The election victory, 255-104, culminated an intensive organizing campaign in which the president of the CIO Paperworkers Union local in the area cooperated heavily with his fellow CIO members.

•

Koppers Co.: Under the terms of a new contract, signed recently after being in negotiation since last July, the Kopper's plant at Kearny, N.J., will grant a 9½¢ wage increase retroactive to the expiration of the old contract.

In addition the new contract establishes a minimum wage rate of $1.56½ per hour with a maximum of $2.58½. Another paid holiday was added,

PERFORMANCE



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bringing the total for the plant to ten.

Although the contract was just signed, the Gas, Coke & Chemical union committee is already preparing to reopen talks for a further increase this month. The contract expires this coming summer.

•

Tennessee Phosphate: Mine-Mill locals in the middle Tennessee phosphate area have reached settlements with two chemical companies. Virginia-Carolina Chemical Corp.'s Mt. Pleasant and Wales plants signed up for a total wage increase of about 10½¢ an hour per employee, including a general wage increase of 8¢ an hour. The new contract also calls for higher shift differentials, more vacations, other benefits.

The second company in the area to sign with Mine-Mill was Hoover & Mason, which reached agreement on 10¢ an hour retroactive to Dec. 1.

EXPANSION . . .

Iron Rouge: Stabilized Pigments, Piscataway, N.J., has upped production of red iron oxide from 80 to 200 tons per month. The company uses a continuous process for converting wet iron sulfate to the dry iron pigment.

•

Coal Tar Products: Construction work is now under way to expand present capacity about ten times at Allied's Barrett Division tar processing works at Youngstown, Ohio. Expansion, which will cost an estimated $1½ million, is expected to be complete by April. The plant processes crude tar from coke produced by the Youngstown Sheet & Tube Co.

•

Propylene Polymers: There's a good possibility that propylene tetramers from Gulf Oil's Port Arthur, Tex., refinery may go into more than high-octane gasoline. Sample use: surface-active agents.

Incidentally, the upgrading of propylene (now burned at the refinery as a fuel gas) will be accomplished with a phosphoric acid catalyst.

•

Glycerine, Ethyl Chloride: Shell Chemical, which recently added new production units for these chemicals at its Houston, Tex., plant, now has its equipment working at capacity. Synthetic glycerine output has been upped 50%, ethyl chloride, 30%.

•

Rayon Pulp: Rayonier, Inc., will construct a $25 million pulp mill in southeastern Georgia, near Jesup. The mill, Rayonier's fifth, will produce 87,000 tons of purified cellulose per year, to be used primarily for high-tenacity yarns needed for tire cord, parachutes and rubber belting, but which could be used to produce nitration pulp.

KEY CHANGES . .

Kenneth C. Towe: From director to president, American Cyanamid Co.

Harry D. Brown: To deputy director, rubber division, NPA. He is assistant production manager, Gates Rubber Co. (Denver).

Herman W. Zabel: From associate editor, CW, to director, research and development, Chemical Enterprises, Inc. (New York).

Donald J. Eccleston: From manager, textile division, to general manager, Warwick Chemical Co.

G. B. Walden: To vice president in charge of biochemical manufacturing, Eli Lilly & Co.

J. C. Siegesmund: To vice president of engineering, Eli Lilly & Co.

George O. Curme, Jr.: To director, Union Carbide and Carbon Corp.

W. F. Twombly: To director, Witco Chemical Co.

J. T. Sheehy: To executive vice president, Rayonier, Inc.

A. N. Parrett: To vice president in charge of research and development, Rayonier, Inc.

F. S. Elfred: To executive vice president, Olin Industries, Inc.

B. E. Bassett: To vice president for production, Olin Industries, Inc.

M. W. Acker: To vice president, Olin Industries, Inc.

Chalmer G. Kirkbride: From vice president, research and development, to president, Houdry Process Corp.

Pierre D. Houdry: To vice president, sales, Oxy-Catalyst Mfg. Co.

John T. Dillworth, Jr. From Sterling Products International, Inc. to export manager, J. T. Baker Chemical Co.

A. W. Hutchinson: To manager, chemical division, Shell Oil Co. of Canada.

DIED . . . . . .

Robert C. Gasen: Vice president in charge of corporate affairs, Bristol Laboratories Inc. He was among the passengers on the American Airlines plane which crashed in Elizabeth, N.J. recently.

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RESEARCH . . . .

Scorecard on Research

What are the problems facing industrial research today?

This week CW surveyed research executives throughout the nation, listened to their gripes and suggestions, learned what their companies are doing to keep research on a sound footing.

Here's what they say about:

MANPOWER

No one denies the shortage of technical manpower, but no easy generalization can be made as to its over-all effect on the industry. Shortages exist in all fields and all levels of scientific manpower. Some are worse than others; Ph.D. physical chemists and physicists are particularly hard to come by. But for that matter, so are chemical engineers with advanced degrees. And many companies are having a lot of trouble finding recent graduates with B.S. degrees in chemistry.

Although the technical manpower situation is being felt, in one form or another, throughout the country, its impact seems to vary with geography. In the East and Midwest, experienced men command the top premiums.

Not so in the Far West. Several West Coast firms report that recent graduates with B.S. degrees are hardest to locate. "Other students and recent graduates," says a prominent research director in the San Francisco area, "seem in fair supply—all things considered—and there is absolutely no shortage out here of men with three, four, five and ten years experience."

This is no isolated case. Essentially the same story comes from several other California companies and at least one other well-known industrial organization echos the abundance of ten-year men.

The reasons for this relatively happy state of affairs in the West isn't hard to spot. It's what the natives like to call "the appeal of Western living." There must be something to it; one familiar chemical concern in the area states that it receives "an excessive number of applications from Eastern chemists and engineers who want to work in California at no increase in salary."

The scarcity of technical manpower is an industry-wide ailment, but there's no systemic cure. Each individual company must compete in a seller's labor market. And there isn't any sure-fire technique guaranteed to bring a flock of high-grade chemists, engineers and physicists scrambling to the door of the personnel director.

Industry is generally agreed that the success of a recruiting program is often a function of common-sense planning, a keen sense of what makes a scientist happy in his job and a vigorous effort to get the story to the labor source early and often.

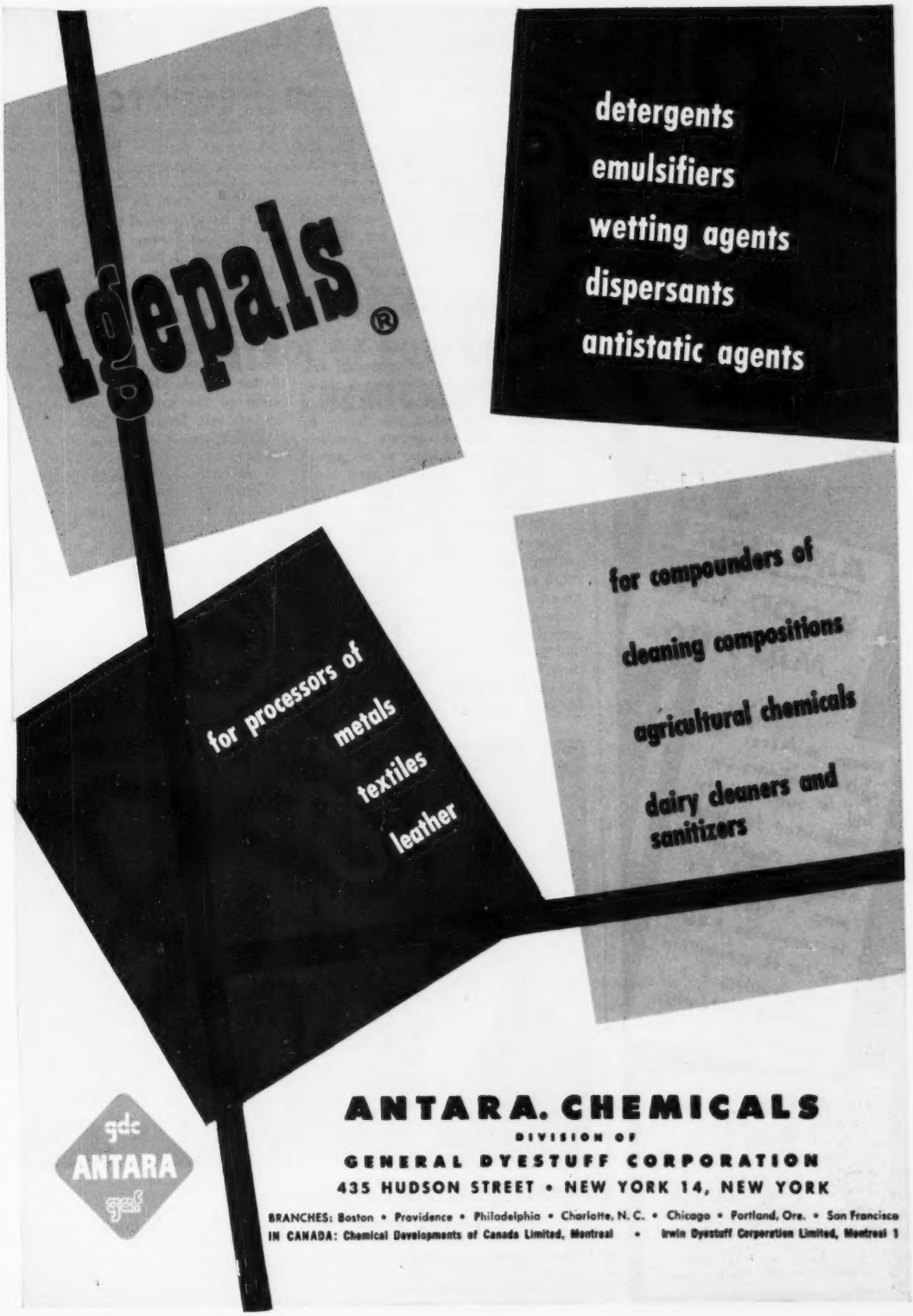
Here's how companies are putting these principles to practice:

Most are convinced that an equitable salary is the soundest foundation for their recruiting program. A research director in the Buffalo-Niagara Falls area has this to say, "We're paying more money now to get technical men than we have in a long time. Pay rates here are up about 20% from 18 months ago. But the increased pay isn't solving our problem completely. We're counting on colleges and universities for a lot of men. We anticipate our needs and so inform these institutions a year or two in advance."

Colleges and universities are now getting a bigger play from industry than ever before. More companies are sending more representatives to the once-cloistered academic halls—and usually on a full-time basis. Too, a noticeable effort to reach the formerly ignored smaller schools has become apparent.

Recruiting doesn't halt at the college level either. One of the largest chemical corporations runs a vocational guidance program at the high-school level. It realizes that results can't be expected for several years, but believes its plan is the only sound way of tackling the problem.

A company with research laboratories in Illinois reports, "For the past four years our company has taken part in the annual Chicago Area Career Conference, sponsored jointly by the Chicago Technical Societies Council, Illinois Institute of Technology and the *Chicago Sun-Times*. There we encourage high-school and junior-college students to become interested in pursuing technical courses of study."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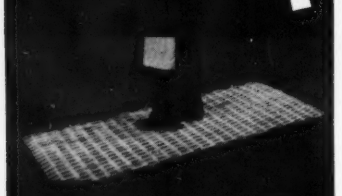

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Tied in with the stepped-up efforts of the individual companies is a growing awareness of the need for combined strategy. Increased support is being given to organizations like Engineers Joint Council, which provides manpower information to industry and cooperates with Government agencies on the broad problem. A supplementary program for the entire chemical industry, being shaped by Manufacturing Chemists' Association, is perhaps the most striking example of how industry is trying to help itself.

Keep 'em Happy: New blood is vital to the health of research. But equally important in the eyes of many is preserving a capable staff, getting the most from what you have. In general, turnover among research people does not appear to be a serious problem. Firms that have been hard hit, however, have lost most of their personnel to the Armed Forces and Government research agencies.

Keeping turnover to a minimum has become an essential objective of today's research director. How he goes about it may vary in detail from case to case. Pension plans, merit bonuses, periodic salary hikes, insurance plans and paid vacations are important inducements. One prominent company has extended its extra-curricular benefits right down to profit sharing.

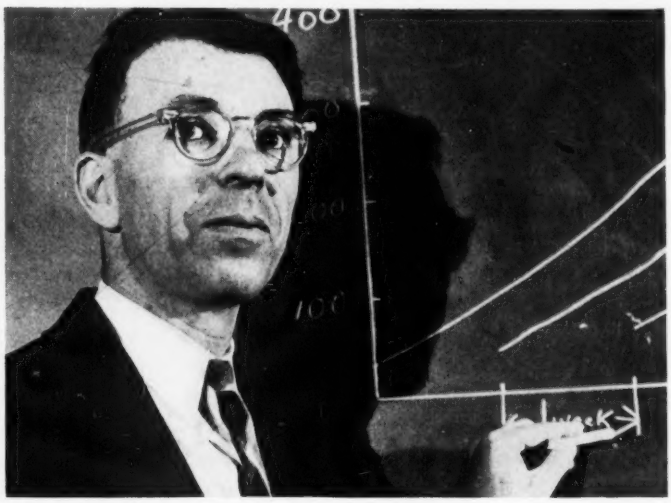
Advocates of one or all of these benefits may be found. And you don't have to look hard for opposition to the whole fringe-benefit idea. But on one point there is universal agreement: A researcher is happiest when he is interested in his work. To keep him happy, firms are making a greater effort to give good men assistance, cut down on routine jobs.

Evidence of this trend comes from the vice-president of a major chemical organization. He says, "Within the company we are making an intensive survey of our assignments for technical personnel to make certain that their technical abilities are being used to the utmost. This includes consideration of the extent to which technicians may be used efficiently."

One company, which boasts a rate of turnover less than one-quarter of the national average, puts its faith in industrial psychologists to supervise recruiting and advise on general personnel policies. It tells CW, "Through their work on the improved screening of applicants and correct job counseling, we have been able to achieve this low turnover record."

EMPHASIS

Evidence of a general shift in research emphasis is lacking. Many companies told CW that their investigations are following a normal course



Spotlight on Folic

NEW FACTS concerning chemical changes which take place in living tissues are coming to light through the experimental use of folic acid. That's the story Thomas H. Jukes, head of nutrition and physiology research at Lederle Laboratories Div. of American Cyanamid Co., told the recent International Vitamin Conference in Havana. Latest advance: synthesis of a "citrovorum factor," a close relative of folic acid with similar anti-anemic properties.

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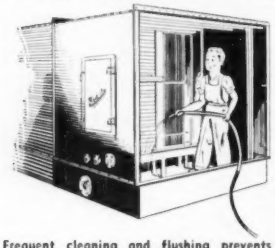

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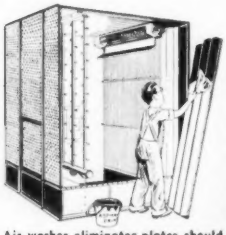
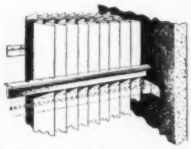


Air washer eliminator plates should be painted yearly or oftener if necessary.

"Buffalo" Air Washer



"Buffalo" Eliminator plates are easily removed for cleaning and painting.

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with no special change in direction planned for the foreseeable future. However, a significant number flatly state they are giving increased attention to applied over fundamental research.

Reasons for this swing aren't hard to understand: Applied research is more likely to bring quick returns. Although sales volume is high, the profit picture is poor. And most companies just don't gamble heavily on long-term basic research in such a situation. But basic studies aren't getting a complete brush; a substantial body of opinion believes that corporations are still favorable to long-range research, want to be sure, however, that it is limited to a small percentage of total work.

Another explanation for stepped-up applied research is put this way by one research manager, "Twenty years ago you could sell almost any chemical by simply advertising it. Today you've got to go out and show industry how to use it to get the order."

Surprisingly enough, military projects do not appear to take a very large share of the industrial research effort. The petroleum industry is a striking exception, although most of the industry feels that the bulk of the military work is yet to come.

BUDGETS

Appropriations for research are definitely on the way up. Increases of 25% over last year aren't uncommon, the most company spokesmen expect substantial boosts in next year's budgets as well. Part of this rise is due, in most cases, to normal growth; but soaring costs are leaving their mark. A top executive of a Midwest concern puts it this way, "With operating expenses increasing as they are, it takes more money to maintain the current position of research. Anyone who spends the same number of dollars this year as last is receding."

Moreover, management doesn't seem to be raising much of a squawk over the need for digging down deeper into the coffers. A research manager whose department received a 25% increase over last year told CW, "We got that 25% after less than ten minutes before the board of directors. And what's more, they told us that they would give us more if and when we need it."

But that happy experience is more likely the exception rather than the rule. The consensus is that management is looking very carefully at research expense, trying to get more effective research for less money—which, incidentally, is the way it

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EQUIPMENT

High costs and slow deliveries seem to be the rule, particularly in the case of specialized equipment. Copper, brass and stainless-steel equipment are very tight; electric and electronic items also are a headache. So far, equipment shortages and slow deliveries do not seem to have interfered seriously with research schedules, but the feeling is that things will get a lot worse before they get better.

Priorities are helping some, but most have to take their chances and hope for the best. To speed deliveries, one firm has hired three expediters who are experts on government priorities and regulations as well. Its representative says the situation is analogous to the experience of California sardine fishermen, "They still get the sardines, but the man-hours required per sardine are getting higher and higher."

•

Picoline Prep: Another slant on synthetic pyridines this week comes from the Far East. Indian researchers have obtained good yields of 5-ethyl-2-picoline by reacting acetylene and ammonia in the presence of ammonium acetate.

•

Double Heat: Estradiol cyclopentylpropionate (ECP), a new hormone developed by Upjohn Co., Kalamazoo, Mich., has a commercial future in the treatment of sterility in livestock. More important, ECP holds the promise of doubling the yearly production of lambs. Tests by a number of agricultural colleges and veterinary practitioners indicate that ECP will bring ewes (normally fertile only in late fall and winter) into heat twice a year.

•

Color Booster: When green and blue phthalocyanine colors are used with General Electric's new resin, only half the amount of pigment is required to get a color intensity equal to that obtained with conventional resins. That's the claim General Electric's Chemical Divison makes for its new textile printing vehicle, G-E Glyptal alkyd resin 91033.

Here's why: The new vehicle keeps pigment particles apart so that each particle contributes to the color of the print. It also prevents pigment particles from running into the spaces between the fibers of the cloth, adds to the sharpness of the printing job.

G-E says 91033 was developed for printing brilliant contrasting colors.

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Applications mentioned above are just a few of the many potential uses for this versatile thermoplastic material. We'll be glad to give you technical assistance in developing the right base and the right formulation for ***your*** specific application.

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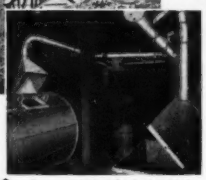
Sly Dust Filter at the Walker China Co., Bedford, Ohio, prominent in the production of vitrified china for 25 years.



Two points of dust origin. Note hoods into which *all* dust-laden air is drawn, thence piped to Sly Dust Filter.

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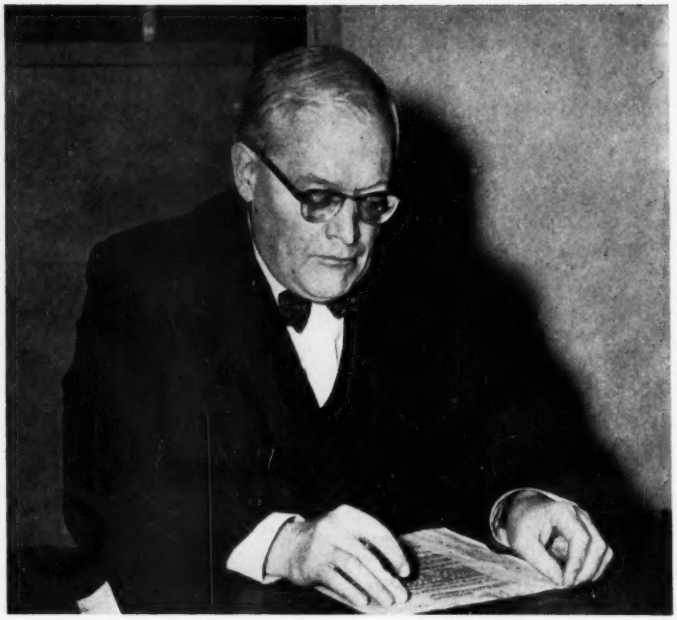


1 LEONARD NICHOLL, co-inventor of the cyanoacetic acid process, heads up Kay-Fries research. Use of the acid is broadening in pharmaceutical production.

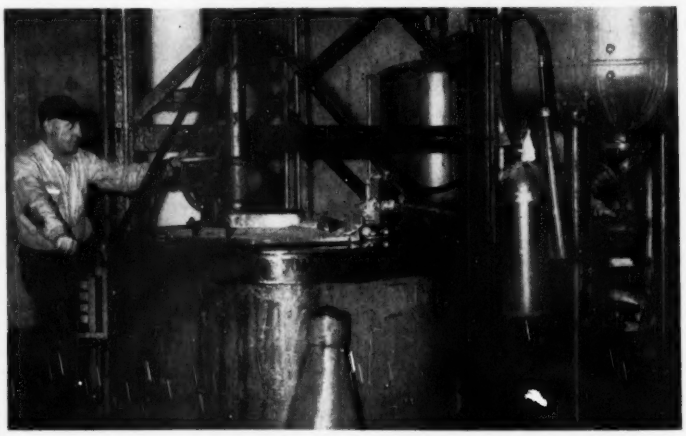
PRODUCTION . . . . . .

Two Heads are Better

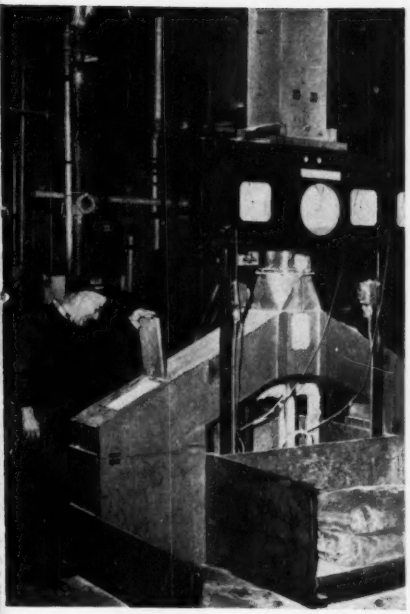
It is convenient, conventional and usually accurate to regard research and production as distinct, independent functions. But actually the two groups are complementary, and best results flow from a team effort.

Kay-Fries' process for cyanoacetic acid is a case in point. The production department recently brought in a 50% increase in capacity that was made possible by close coordination of research results and engineering techniques.

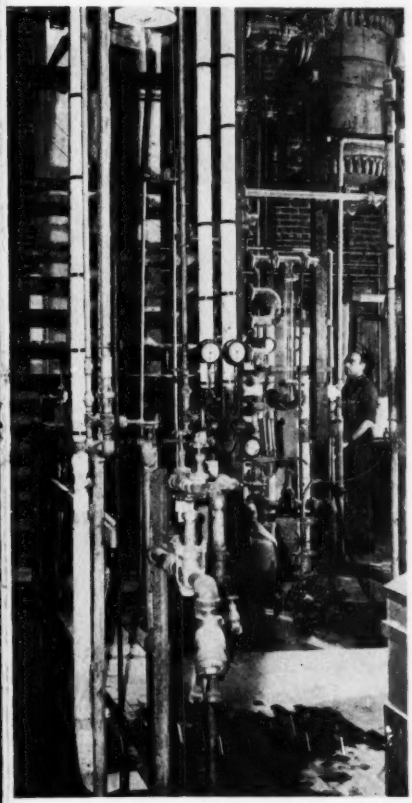
Problem: When Kay-Fries looked into the possibility of producing cyanoacetic acid, it was confronted with several problems. Preparing the acid in water solution posed no great difficulties, but separating it did. Researchers discarded as too tedious an



3 THE RESULTANT SODIUM CYANOACETATE is acidified; centrifuge removes salt from the crude aqueous brine solution of cyanoacetic acid.



2 SODA ASH and sodium cyanide are added to chloroacetic acid.



4 THE ACID IS THEN extracted from the brine solution.

DOW CORNING SILICONE NEWS
NEW FRONTIER EDITION
SIXTH OF A SERIES

Tall Tale

Heat never hurt Joe Magarac, the strong man of Steel Valley. Night and day he'd sit in the door of No. 7 furnace on the open hearth, stirring and tasting the melting steel. When it tasted right, he'd scoop it out by the handful and spill it into the ingot molds. Then he'd take and squeeze the ingots until the prettiest steel rails you ever saw came rolling out between his fingers.

to Fabulous Fact

They say Joe Magarac was made of iron and that's why heat never hurt him. Same's true in a different way of Silastic*, the Dow Corning silicone rubber. Built on a heat-stable skeleton of silicon and oxygen atoms taken from sand, Silastic thumbs its nose at heat and cold. It's the only rubberlike material that won't melt or become brittle at temperatures from −100° to over 500° F. That's why they use Silastic to hold hot oil in aircraft engines and automobile transmissions; to seal aircraft heating and deicing systems and to keep cooling fins on aircraft engine cylinders from breaking. Silastic also keeps your steam iron from leaking; insulates diesel-electric locomotive motors; keeps communication systems operable in warships under fire; retains its properties at temperatures too hot or too cold for any other rubbery material.

*T. M. REG. U. S. PAT. OFF.

Write Today for our new 1951-52 *Reference Guide 8R-14 to the Dow Corning Silicones that improve products and production methods.*

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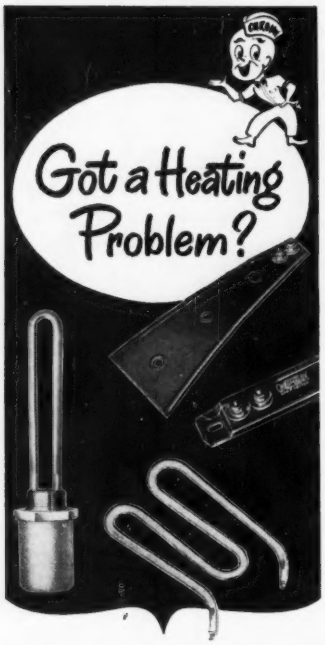

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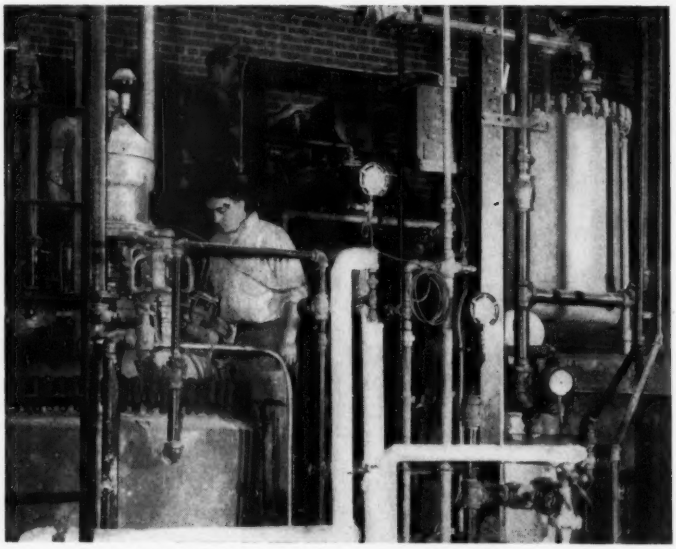
ELECTRIC HEAT
FOR MODERN INDUSTRY

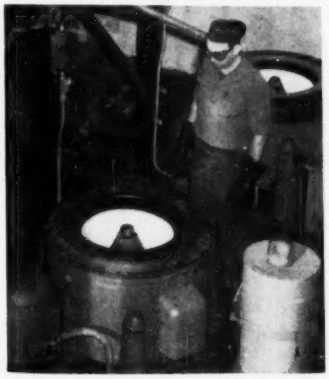


5 AFTER THE SOLVENT IS REMOVED by steam distillation, the aqueous, salt-free solution of acid is sent to the concentrating stills and crystallizing tanks.

early method consisting of precipitating the calcium salt, then treating with sulfuric acid. They also rejected as impractical the idea of direct crystallization or distillation.

Leonard Nicholl and Herbert Elkinton developed a solvent extraction process using methyl isobutyl ketone or mesityl oxide, but that too left room for improvement. Nicholl and Alvin Flisik then found the solvent could be steam distilled and the acid crystallized from water.

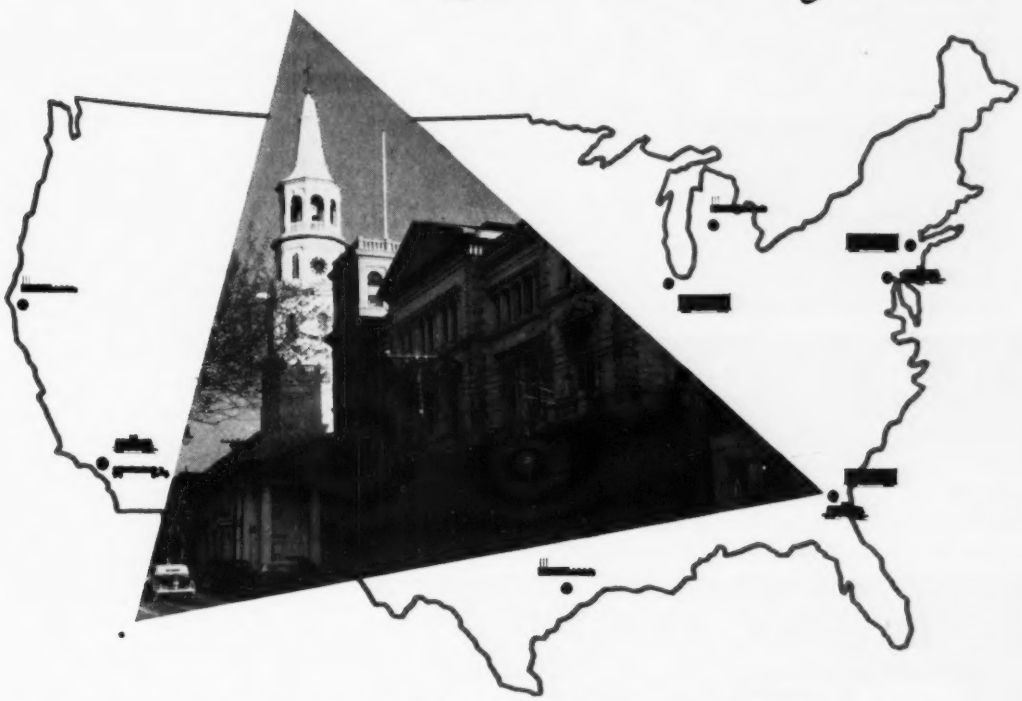
Production is now around a million pounds a year of 98%-minimum-purity acid. Moreover, the process separates the acid in the form of white crystals which are easier to handle in the plant and by customers.



6 CENTRIFUGES SEPARATE the high purity acid as white crystals.

7 ALVIN FLISIK AND W. P. BITLER discuss production schedules. Flisik is chemist in charge of process development; Bitler is v.p. and plant manager.

how close are you to *Charleston, South Carolina?*



Charleston is a main distribution center for Dow Caustic Soda!

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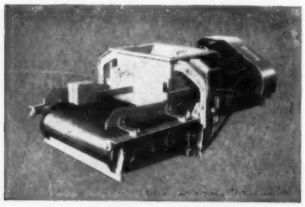

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PRODUCTION . . . .

Rectifier Control

The W. Green Electric Co. reports that it is now incorporating Thermoswitch units (made by Fenwal, Inc.) in its selenium rectifiers, which are used for the conversion of commercial ac current to low-voltage, high-amperage dc current for the process industries. The Thermoswitch units are highly sensitive (±0.1 F) temperature controllers and are incorporated to eliminate excessive heating of the selenium layer that comprises the rectifier stack.

Some rectifiers protect the selenium layer through a mechanism that cuts off current when it exceeds a certain fixed value. Another solution is a power cut-off that is activated when the cooling air fails. Neither of these is the ultimate answer, says Green, because the stack temperature, which is the controlling factor in the life of the selenium plates, is a function of many variables.

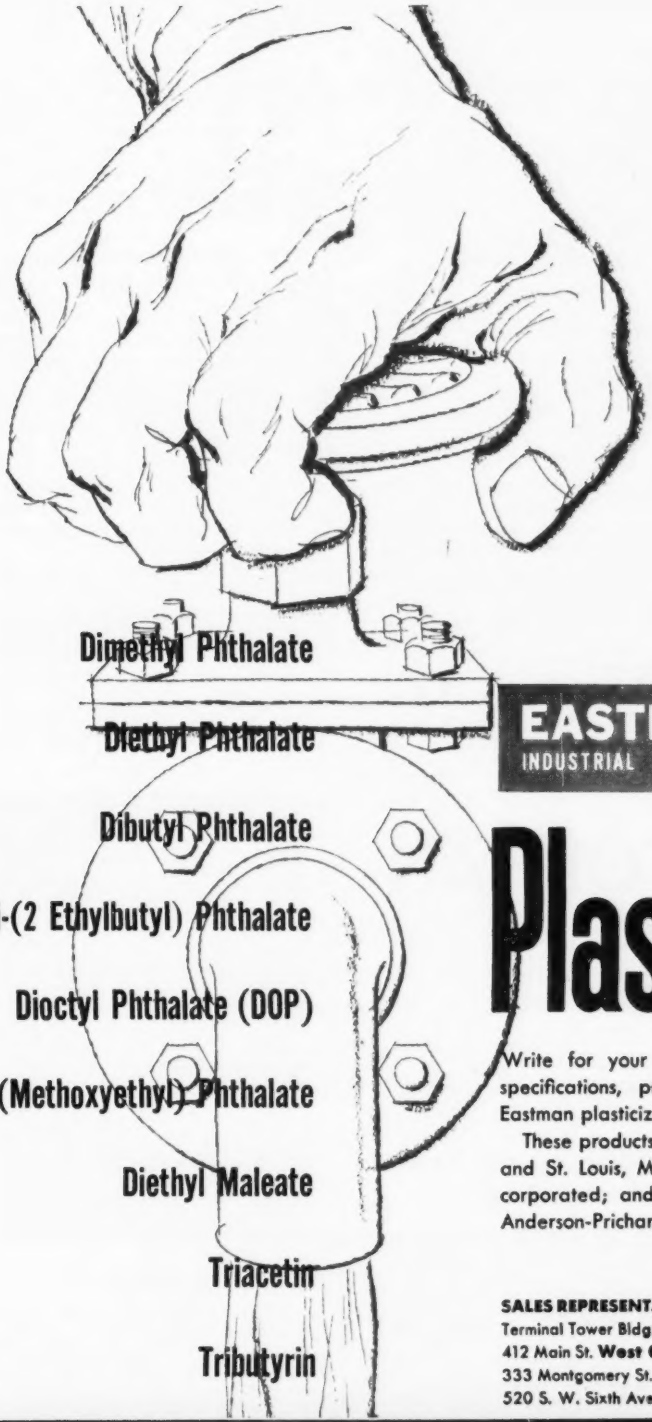
In the fan-cooled Green rectifiers, a pair of Thermoswitch controls are installed directly below the stack in the line of warm air after it passes the plates. One of the controllers, set at approximately 163 F, sets off a warning signal whenever the temperature goes beyond that point. The other unit cuts off power if the temperature goes beyond 167 F. The spread in temperature permits a short but desirable time lag, says Green, for the operator to make the necessary adjustment before the power is shut down. That should prove an important feature in processes where shut-down time is expensive.

EQUIPMENT. . . .

New Vibrator: Martin Engineering Co. says it has a new, DV 51 vibrator that incorporates all the features of the company's smaller units. It is said to require no lubrication and a minimum of maintenance. The vibrator is aimed at applications wherever it is necessary to move materials that must be fed from hoppers or bins.

•

Coat for Maintenance: Du Pont is pushing a neoprene lining for the outside of tanks and process equipment. Unlike the familiar neoprene lining for the inside of equipment that will withstand direct immersion in corrosive liquids, the newer version is designed to protect only against splash, spill or corrosive atmospheres. Du Pont says the external coat shows excellent resistance and can be brushed easily despite a high solids content. A second coat can be applied within 2 or 3 hours of the first coat or it can be used for touch-up or patching old



Dimethyl Phthalate

Diethyl Phthalate

Dibutyl Phthalate

Di-(2 Ethylbutyl) Phthalate

Dioctyl Phthalate (DOP)

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coats. Principal drawback is that it is a two-part system, and the consumer must add the accelerator himself. After acceleration, pot life is reduced to 12 to 36 hours. Furthermore colors other than black can be obtained only at the expense of chemical or abrasion resistance.

•

Glass Fiber: Reardon Industries is now selling fibers made from glass. Available in 5, 10 or 25 lb. units, the fibers are said to be superior to asbestos from an insulating standpoint. Suggested applications so far: waterproof caulkings, waterproof packings and as a replacement for certain types of binders that are currently made of imported asbestos.

•

NPA on Stainless: Last week, NPA decided that since production was outrunning demand, it would release chrome stainless steel from its Controlled Materials Plan for rationing metals. But as it decontrolled chrome stainless, it cut the amount of nickel-bearing stainless for which users may "self-certify" their own orders. Previously, a consumer could write his own ticket for 1,500 lbs. of all type stainless steel per quarter. Effective last week, he can self-certify only 500 lbs. a quarter.

Import Relief

GENERAL ELECTRIC is the proud possessor of the latest process for using domestic mica for electric insulators. G. E. will go into commercial production this year, says it will help ease our dependence on foreign sources of supply. It says the product can be impregnated with resins and bonded to glass, cloth or paper to increase strength and electrical resistance. The company foresees its use in new laminates and tubing.

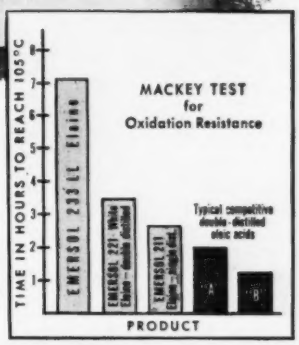
Guard Against this "Sales-Stopper"!

—with the exceptional stability of EMERY FATTY ACIDS!

The more stable your products . . . the better they sell. To be sure *your* products reach your customers as fresh, pure and appealing as the day they were made, insist on the superior rancidity-resistance possessed by Emersol Stearic and Oleic Acids. This characteristic, coupled with exceptional color and oxidation stability, is a direct result of exclusive Emery processes and guards the sales appeal of many of the finest products in America. Buy Emery and be sure your products are better, look better, sell better . . . far longer!

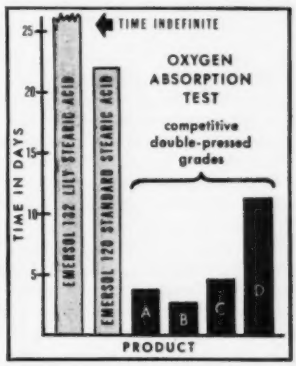
EMERSOL OLEIC STABILITY

The Mackey Test measures the auto-oxidation tendencies of oleic acid . . . giving proof of the superior oxidation stability of Emersol Elaines, as indicated by longer times.



EMERSOL STEARIC STABILITY

This oxygen absorption test, which measures the time required for the absorption of a standard quantity of oxygen in a closed system, clearly illustrates the amazing stability of Emersol Stearic Acids.



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New Aerosol market study in number of

Nationwide "Freon" survey shows more dealers now stock pressure-packed products

When more than 2,000 retail dealers were personally interviewed during the recently completed fifth annual Du Pont survey of the aerosol market, 75% reported that they are now stocking one or more pressure-packed aerosol products.

This represents an increase in retail outlets of 76% over a similar tabulation obtained in 1947 when the first "Freon" aerosol market survey was conducted.

The study shows that dealers in six principal retail-trade classifications—drug stores, department stores, food stores, hardware stores, variety or 5 and 10¢ stores, and auto supply or service stations—have recognized the sales potential of this new, modern way of packaging many products heretofore sold in other type containers.

Dealers, obviously, welcomed the appearance of these new aerosol products and have profitably featured them in their stores.

THINK HIGHLY OF AEROSOL PACKAGING. Asked their opinion of pressure-packed aerosol products, more than 80% of the dealers interviewed in all six categories of trade said they believe this method of dispensing is better and more effective than older methods.

This attitude is further reflected both by their comments and the enthusiastic way in which the majority of retail dealers have merchandised various kinds of aerosols.

CONSUMERS AGREE. Up to 93% of these progressive merchants also stated that few, if any, of their customers had voiced dissatisfaction with aerosol products for either household or personal use.

Here again, the "Freon" aerosol market survey shows that a large percentage of dealers who stock and sell aerosols and consumers who buy and use these products are favorably impressed with them . . . an important point for the manufacturer considering the introduction of one or more pressure-packed products.

SALES BETTER THAN LAST YEAR. To the question—"How do your aerosol-product sales this year compare with those of last year?"—a total of 44% of the

DU PONT
REG. U.S. PAT. OFF.
BETTER THINGS FOR BETTER LIVING
. . . THROUGH CHEMISTRY

"FREON" SAFE

reveals steady increase retail outlets

dealers who stocked aerosols both years replied that their sales had shown substantial gains. Another 44% said that sales were probably "about the same."

A breakdown by dealer classification indicates that these sales increases were made in all six types of retail outlets studied, and in some instances better than 50% (department stores, for example) reported sales far ahead of the previous year.

DIGEST OF AEROSOL SURVEY—*FREE*

Purpose of this fifth annual Du Pont aerosol market survey is to provide the industry with timely data relating to dealer and consumer attitudes and reactions toward this relatively new method of packaging various products.

Previous "Freon" market studies were so well received, informative and helpful that we have been encouraged to prepare a booklet digest containing all the salient facts developed by this latest survey of the market.

A copy of the digest, "The Aerosol Market," will be sent free upon request on your letterhead. Address: E. I. du Pont de Nemours & Co. (Inc.), "Kinetic" Chemicals Division, Wilmington 98, Delaware.

"FREON" PROPELLENTS . . . A BIG FACTOR IN GROWTH OF AEROSOL INDUSTRY

Ever since the first "Freon" pressure-packed aerosol product—an insecticide—appeared on the domestic market, users have been enthusiastic about this modern method of dispensing.

The product immediately proved convenient and easy to use . . . without fuss or muss. It proved effective and more economical (when properly used) than similar products packed in other type containers. And it proved entirely safe . . . an essential characteristic of any aerosol.

"Freon" propellents (products of the Du Pont Company) are ideal for aerosols, and their use in pressure-packaging many different products has helped stimulate the rapid advance of the industry.

"Freon" propellents are safe . . . nonflammable, nonexplosive, virtually nontoxic, harmless to fabrics and finishes, chemically pure and thoroughly dependable. There are several "Freon" propellents, and they can be formulated to meet the exact requirements of any pressure-packaging you may be considering. Complete information about "Freon" propellents and their use will be sent upon request.

PROPELLENTS

KINETIC
REG. U. S. PAT. OFF.

"FREON" is Du Pont's registered trade-mark for its fluorinated hydrocarbon propellents.

I'M GETTIN' OUTA HERE—FAST!

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"KARBATE" TOWERS do more than retard corrosion – they eliminate it *entirely* from such processing operations as absorption, fractionation, evaporation, extraction, scrubbing, and many others. Furthermore, the widespread acceptance of impervious graphite for all types of corrosion-free process construction has resulted in the manufacture of monolithic tower sections and fittings in sizes to 24" I.D.

For example, the tower illustrated here incorporates the following standard components: *bottom section* with gas inlet, liquor outlet and support grill; *intermediate section* with hand hole and packed with carbon Raschig rings; *short intermediate section; top section* with "Karbate" feed assembly and wier plate distributor; and *cover* with gas outlet. All sections and fittings, including spring-loaded tie rods and heavy-steel pressure plates, are available for quick assembly to your specifications.

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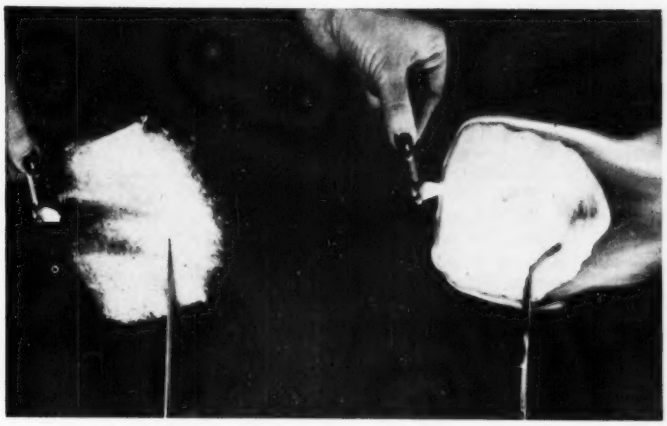

FLAME RETARDANTS: Interest has been rekindled.

Wanted: The Slow Burn

Demand for regulations on flammable clothing, touched off by accidents involving "torch" sweaters, directs attention again to flame retardants.

Durable, mill-applied processes are available now, as well as spray methods, but hopes lie in another direction . . .

Bromo-allyl-phosphate resin coating of fibers, still under Quartermaster Corps-sparked development, seems to be the brightest prospect in years.

Recent, almost explosive reports on flash-burning sweaters of cheap brush rayon have awakened the public and its legislators to the fire hazard of certain types of clothing.

Most textile manufacturers, concerned with the matter even when not prodded by prospects of regulation, are reviewing available ways to reduce this fire menace, are wondering how much it will cost them.

Fortunately, processes which will enable manufacturers to meet pending laws are on the market now. Various means have been worked out, largely in the last few years, to make clothing flame retardant. These differ in degrees of durability, expense, and ease of application. Firms offering processes report definite perking of interest in their products the last few weeks.

But there's still room for improvement, and brightest hopes seem to lie in a resin fiber coating of brominated allyl phosphorus compounds.*

Brow Creaser: Tough to apply, and still expensive, the value of bromo-allyl phosphates has been known for some time, but difficulties in using them dampened interest. Briefly, the process is this: An allyl phosphate is prepared, brominated slightly to limit polymerization, then polymerized and applied to the fabric in an organic solvent. A thin stiffening film remains on the fibers, which must be softened by scouring to restore the "hand." There is no loss in fiber strength.

Now the Quartermaster Corps is pushing the project, but is close-mouthed about who is doing the research, and the uses it has in mind.

Patents covering the process were issued last June to George E. Walter, Irwin Hornstein, and George M. Steinberg, and assigned to Glenn L. Martin, the aircraft company, but beyond that, the QM says nothing.

What's Been Tried: The Quartermaster Corps got hot for flame retardants during the last war, hasn't cooled much since. Before the QM was intrigued by Walter's bromo-allyl phosphates, its researchers had produced several fairly satisfactory methods.

One was a mixture of borax, boric acid, and diammonium phosphate in water; a second—more durable, and

* Recalls Victor Chemical's 1947 development, the clear, non-flammable plastic, diallyl phenyl phosphate.

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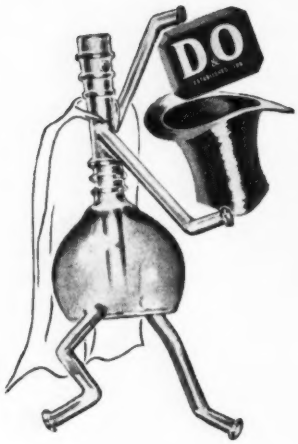

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not easily washed out—employed antimony oxide in a vinylite polymer, applied with methyl ethyl ketone.

Since the war, commercial companies have continued the hunt for flame retardants. At present, among the most durable materials are modified urea phosphates (American Cyanamid's Pyroset); melamine polyphosphates, water-applied and heat-set (Monsanto); and a mixture of antimony and titanium oxides applied in hydrochloric acid (Du Pont's Erifon).

Protection Costs: Any treatment for textiles ups the price of the finished product. The size of the markets for retardants is governed by how much of the increased cost of the fabric a textile processor can pass on to his customer. According to one estimate, if he must tack 10¢ per yard on the cost of the treated goods, the potential market for retardants is ⅒ what it would be if he could sell treated cloth at no increase in price.

Costs naturally vary with the cloth used and the treatment employed. Processes applied to heavy-duty work garments sometimes cost as much as 25¢ per yard of material; for everyday wearables, subjected to much lighter hazards, less retardancy is necessary, and the cost is lower. Treatment of 4-oz. sheeting with Du Pont's mill-applied Erifon runs about 7½¢ per yard for chemicals alone.

There are two main factors involved in the flammability of a cloth: The structure of the fabric (whether it is a loose, open weave or a tight close weave), and the structure of the fiber molecule.

Basically, since all our fibers are of organic nature, they will burn if subjected to enough heat. But a brush finish material of untreated rayon, for example (like the news-making sweaters) will burn much more rapidly than similar material of nylon.

Flame retardants are designed to raise the flash point above generally encountered temperatures, slow the burning rate, and render fabrics unable to support combustion—not even to glow—when the flame source is removed.

Extinguishing Action: Flame retardants are theorized to work in four general ways:

Some—Du Pont's Erifon is an example—modify the cellulose molecule, so that when ignited, the production of flammable products is lowered.

Others produce a flux or foam which retards the flame by coating the fibers.

Early methods of weighting fabrics with salts slowed burning simply by loading fiber interstices with nonflammables.

And still other processes work by evolving a flame-blanketing, noncombustible gas.

Fabrics most in need of flame retardants are the open weaves—nets, brush and pile finishes, chenilles. Carpeting, curtains, and upholstery for planes, trains and ships, and for use in public buildings, are generally treated as safety measures.

Cotton and regenerated cellulose rayons have received most attention, because of their wide use and because they burn more easily than many other fibers. Fortunately, processes developed for them frequently can be applied to other fibers.

Overrider Rescue

Cosmetic manufacturers and distributors trying to adjust their ceiling prices to conform both to OPS regulations and the new trade practice rules prescribed by the Federal Trade Commission recently *(CW, Dec. 15)* can look to OPS General Overriding Regulation 18 for help.

GOR 18 specifies that if a seller's ceilings under OPS involve him in unlawful discrimination under the Robinson-Patman Act*, he may be given permission to increase some of his ceilings if he lowers others so as to maintain an over-all total sales position comparable to his former status during a representative period prior to the freeze.

If GOR 18 had not been issued, members of the trade would have found themselves on the spot: Observing FTC's order to obey the new trade practice rules, in effect they would have been raising prices above OPS ceilings to those customers who had formerly enjoyed special services and promotion privileges.

Now, if FTC or any court finds a seller has violated the Robinson-Patman Act or if the seller believes maintenance of existing price differentials would violate the Act, he may apply under GOR 18 for relief.

•

Ink Center: Interchemical Corp. of New York has established a new distribution center at Charlotte, N.C. for its inks.

•

Agriculture Improvers: The Colorado Agricultural Chemicals Association, an organization of manufacturers, formulators, and distributors of agricultural chemicals, has just been

* The Robinson-Patman Act prohibits discrimination in sales prices to different purchasers which might tend to lessen competition or create monopoly. It also prohibits discrimination between competing customers in furnishing of facilities or services, or payment for them.

Bicuspid Proxy

NEW MECHANICAL MULTIPLE TOOTHBRUSH designed by the Victor Chemical Works tests 12 dentifrices simultaneously for excess phosphate abrasiveness. As a motor driven crankshaft drives twelve brush bearing arms over antimony test strips of 45 micro-brinell hardness, a counter automatically records 10,000 double strokes in 90 minutes—equivalent to 100 days of twice-a-day normal brushing.

formed to advise, assist, and otherwise cooperate with state and Federal research programs to promote means of improving Colorado farming.

•

Pheasant Discourager: Corn treated with wireworm-preventing lindane also repels filching pheasants. So tests conducted by Crookham Seed Co. (Caldwell, Idaho) indicate. During the last two years, Crookham—a hybrid seed corn raiser—planted 8,000 acres of lindane-treated seed without loss of a single acre due to pheasant thievery.

•

Parathion Poster: A wall poster succinctly describing how parathion should be handled is being distributed nationally by Monsanto Chemical Co. Parathion spray, dust, dust suspension, or aerosol is a potent, highly toxic insecticide, must be handled with extreme caution by operators equipped with goggles, mask, apron, gloves, and boots.

•

Atlanta Expansion: Parke, Davis & Co. will complete its new $500,000 branch office and warehouse in Atlanta by Sept. 1 of this year.

•

Tryptophan Cut: Prices of synthetic dl-tryptophan, an amino acid essential to animal growth, have just been slashed by Dow Chemical Co. The former $95-per-lb. price (in quantities from 100-499 lbs.) has dropped to $75. In lots exceeding 500 lbs. a new price of $60 per lb. has been established.

•

Emulsions Up: Rubber-base interior paints are really taking hold. Example: Glidden Co. sales of Spred-Satin, its rubber emulsion paint, are said to be up 40% over 1950, and the outlook for '52 is even brighter.

•

Company Purchase: Paisley Products Inc. of Chicago, manufacturer of adhesive raw materials, starches and dextrines, has just purchased the Layton Elastic Glue Co. also Chicago. Paisley will augment and continue the Layton line of products.

PICTURES IN THIS ISSUE:

Cover (top) — Dick Wolters, McGraw-Hill; Cover (center) and pp 34 & 36 — L. F. Stockmeyer; Cover (bottom) — Bemis Bro. Bag Co.; p. 14 (bottom) — R. H. Lanham; p. 22 — Wide World Photo.

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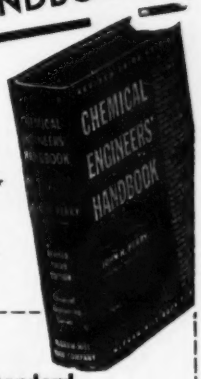

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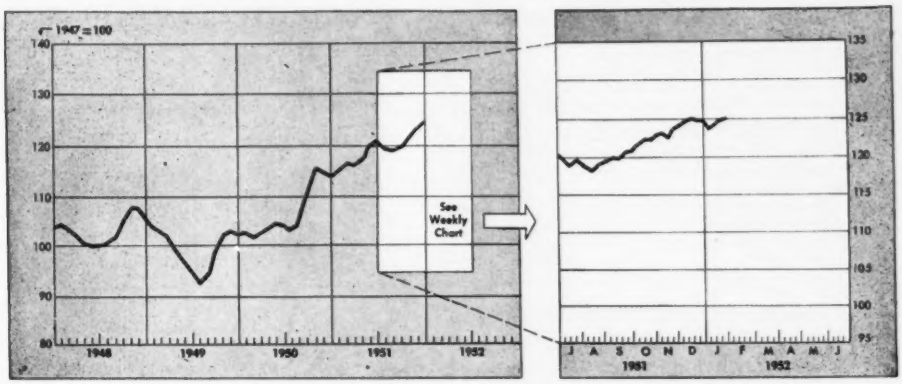


CW Index of Chemical Output—Basis: Total Man Hours Worked in Selected Chemical Industries

MARKET LETTER

They had to wait five months for approval, but sodium silicofluoride resellers can now pass along to their customers the OPS-approved boosts in manufacturers' ceilings. Back in August, OPS—to encourage output for municipal water fluoridation—permitted most of the major producers to raise prices 1-2¢ a pound.

Insecticides are very much in the market limelight, and it isn't just because of the coming spring season. There has been some pre-season price cutting in cotton insecticides, notably BHC, aldrin, and dieldrin. These will undoubtedly firm up again as the season advances.

However, one trend is a virtual cinch to continue: More BHC will be of the high gamma grades. Within a month, at least one more producer will join the growing roster of high gamma converts.

Import duties on lead and zinc are slated to be dropped. But it's a good bet they will be restored if delivered imports are priced below U.S. levels. U.S. production can't keep up with accelerated defense and civilian demands, although DPA is pushing ahead for added domestic output. Example: 200 thousand tons of zinc yearly will come from new DPA-certified facilities within three years.

Not only does a tremendous volume of chemicals come from petroleum, but the petroleum industry is a mammoth chemical customer as well. Just how much it buys has now been estimated by the Petroleum Administration for Defense. Among the big short-supply items consumed: 2 million pounds of sulfur and 27 million pounds of sulfuric acid a month.

Coincidentally, a giant refiner—Jersey Standard and its North American affiliates—added up last year's supply expense, came up with a whopping $401.5 million. Of this $65 million went for chemicals. Prominent items: cracking catalyst, tetraethyl lead.

The petrochemical industry is estimated to take 1½ billion pounds of new sulfuric acid annually, 1 billion pounds of lime, and 525 million pounds of caustic soda, besides a lot of a lot of others.

Some price changes for rubber chemicals are pending, though the

MARKET LETTER

WEEKLY BUSINESS INDICATORS	Latest Week	Preceding Week	Year Ago
Chemical Industries Output Index (1947=100)	124.9	125.0	117.6
Bituminous Coal Production (Daily average, 1000 tons)	1,870.0	1,888.0	1,902.0
Steel Ingot Production (thousand tons)	2,090.0	2,079.0	1,933.0
Wholesale Prices—Chemicals and Allied Products (1926=100)	132.7	133.5	144.9
Stock Price Index of 14 Chemical Companies (Standard & Poor's Corp.)	239.0	245.8	219.1
Chemical Process Industries Construction Awards (Eng. News-Record)	$40,925,000	$71,290,000	$59,172,000

MONTHLY INDICATORS—PRODUCTION (Index 1935-1939=100)	Latest Month	Preceding Month	Year Ago
All Manufacturing and Mining	218	219	218
Durable Manufactures	280	277	268
Non-Durable Manufactures	185	188	197
All Chemical Products	298	298	284
Industrial Chemicals	560	554	504
By-Product Coke	184	184	182

details still must be worked out between the Industry Advisory Committee and the OPS. Currently the industry is faced with wide price differentials since switching from GCPR pricing to CPR-22.

Under the Capehart amendment, OPS points out, both producers and customers have been confused by the varied prices on the same commodity, would probably welcome uniform ceilings. Even producers with above-average ceilings may go along, though in theory, SPR-22 entitles them to more.

Likely outcome: dollars-and-cents ceilings on large-volume chemicals, a percentage boost over GCPR prices on the others.

One of the first rubber chemicals that would be affected price-wise is aniline, more than half of which winds up in rubber processing. If the Defense Production Authority has its way, annual output—exclusive of the national reserve—by 1954 will hit 135 million pounds a jump of 26% within three years. Adequate price incentive on aniline products will provide an extra output spur.

Another 22% of aniline production goes into dyestuffs, a business that has felt two depressing factors since last summer. The standstill in the textile industry has been bad enough, but sharpened competition from German dyes makes conditions worse.

The rapid import rise is reflected in the latest returns compiled by the Department of Commerce. During January-October, 1951, German-made dye imports accounted for 1.5 million pounds, a six-fold increase over the same period the year before.

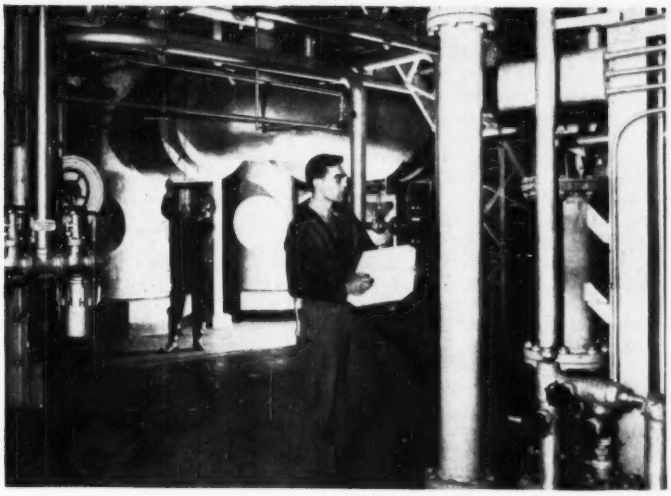
Despite the prospects of rising plastics demand later this year, as of today, most plastics are in comfortable supply. The only one still tight on a steady month-by-month basis is polyethylene. But shortages of some others; aggravated by mounting defense needs, are due to develop. Examples: phenolics, ethyl cellulose, and polyesters.

Hopes of caustic manufacturers who look to greater export sales were dampened this week. Reason: The Government of Colombia has banned further imports. Colombia has, until now, been a good U.S. customer, but its newly opened plant is expected to supply its own needs.

SELECTED CHEMICAL MARKET CHANGES—Week Ending February 4, 1951

	Change	New Price		Change	New Price
UP					
Cobalt naphthenate, 6% Co, dms.	$ .015	$ .43	Tung oil, mp., tanks	$ .005	$ .42
DOWN					
Benzyl alcohol, NF	.01	.64	Casein, dom. standard	.01	.34
Linseed oil, tank car	.005	.195	Quicksilver, 76 lb. flask	1.00	205.00

All prices per lb. unless quantity is stated.



AMMONIUM NITRATE: Production is up but so is demand.

Pinch in Nitrogen

Seasonal upturn in fertilizer buying has again tightened the market for nitrogen-containing compounds.

Shortage is especially felt in ammonia, ammonium nitrate and ammonium sulfate; sodium nitrate is more plentiful.

Ammonia from Morgantown will help at tail end of fertilizer season; other expansion won't be in this year.

Farmers are awakening to the fact that they "just gotta have fertilizer" for this year's crops.

For producers of nitrogen-containing compounds, this means a heavy drain on their supplies of ammonia, ammonium sulfate and nitrate and sodium nitrate. And, despite an increase in output of 5%, they probably won't have enough to meet the demand.

While fertilizers do not take all the nitrogen-containing materials produced, seasonal agricultural demand for them often unbalances the fixed nitrogen market. Since Korea, the variation has been primarily from "tight" to "tighter."

Here is the outlook for specific chemicals.

• **Ammonia.** Demand for this multi-use chemical has outstripped a steady increase in production.

Hooker has begun manufacturing at Tacoma, Wash. (first ammonia plant in the Northwest); Mathieson has increased production at Lake Charles, La., and will begin to ship substantial tonnages from the Morgantown, W. Va., Ordnance Works beginning March 1. Spencer Chemical's expanded anhydrous ammonia and nitric acid facilities at Pittsburg, Kans., are in operation.

Also on the way are expansions by Solvay at Hopewell, Va., and at South Point, Ohio; Commercial Solvents at Sterlington, La.; Shell Chemical at Dominguez, Calif.; and Spencer at Vicksburg, Miss. These won't come in soon enough to substantially aid farmers this year.

Use of bottled ammonia itself as a fertilizer, while still relatively new on a nationwide scale, has been growing (*CW, Dec. 29*). However, shortages of ammonia brought about by other demands and by transportation problems, have somewhat limited the trend. Producers who convert their anhydrous ammonia to ammonium nitrate and sulfate have not been quite so limited in exploiting direct application of ammonia to the soil.

Since the fertilizer season—at least as far as the farmer is concerned—started this month, ammonia shipments from Morgantown will be able to help out during this spring and summer.

• **Ammonium Nitrate.** Supply is, of course, tied to that of anhydrous ammonia, so the same general shortage applies. Demand for explosives—needed for the preparedness program—has been a limiting factor on the amounts available for fertilizer. New production has been coming in, but so far has made little dent in the backlog of orders.

Commercial Solvent's Sterlington expansion and Phillips Chemical's Houston plant are still well in the future, but Spencer is already producing additional nitrate at Pittsburg.

Since supplies have been scarce, producers have been able to take full advantage of higher ceilings resulting from higher costs. Price of domestic nitrate went up $3 per ton in January, and now is at a $64 level.

• **Ammonium Sulfate.** Suppliers predict that about 5-10% more sulfate will be available this year than in 1951. The market, though tight, is less so than that for the nitrate.

Sulfate has no major outlet other than fertilizer. However, in its application here, it can be used in several ways. While mostly compounded in mixed fertilizers, there has been an increasing trend toward application as is in top dressing the soil.

Main source of ammonium sulfate is now synthetic, although a large amount is still made as a byproduct in coking. Previous to 1949, this was the major source.

The coke oven product is usually impure compared to the synthetic sulfate, which farmers prefer for its ease of application. However, Republic Steel has perfected a crystallization process, and now sells a relatively pure coke oven sulfate.

It goes without saying that some of the scarcity of ammonium sulfate can be attributed to the shortage of sulfuric acid. However, this has not hit producers who use only spent sulfuric from other operations as hard as those who must buy it.

• **Sodium Nitrate.** Unlike the previous compounds, sodium nitrate is in relatively good supply. Reason: The price is higher for the amount of available nitrogen it supplies.

Imports of this material from Chile have been increasing. Synthetic production has also increased, but not to the same extent.

In addition to the "normal" ammonia plus soda ash reaction, a small portion of Solvay's Hopewell production is via the nitrosyl chloride. In this, ammonia is oxidized and reacted with salt to give chlorine and sodium nitrate as products.

Production of chlorine by this reaction may, some day, become competitive with the chlorine-caustic process. The market outlook for nitrate is better than that for caustic.

• **Ammoniated Superphosphate.** Supplies of this compound are tied to the apron strings of superphosphate itself, which is in short supply (*CW, Dec. 29*).

Formerly, much of the ammoniation was carried out by the superphosphate producer himself. In recent years, fertilizer mixers have moved toward doing it on their own. This trend has been especially evident in the northern part of the country.

Several agents are used in this treatment of superphosphate—anhydrous ammonia, aqueous ammonia, and a solution of ammonia nitrate in aqueous ammonia.

The Upshot: On the long term, it can hardly be argued that use of nitrogen-containing fertilizers won't increase. Where in 1900, 62,000 tons of fertilizer (ammonium nitrate basis) were used in the United States, the year 1940 saw farmers buying 419,000 tons, which increased to 1,285,000 in the 12 months ending in June, 1951.

Future increases should be as sharp. Estimated nitrogen-fixing capacity on stream in 1955 will be 2,900,000 tons.

For the immediate future, the situation will not be as bright. Barring a shooting war, about 5% more nitrogen should be available for 1952, and 10% for 1953. Producers, however, hardly expect that this will meet demands, and they should know.

Controls Still Needed

The many low-priority customers for methylene chloride who want it mostly for paint remover might have known the news was too good to be true. For last week's reports that it had gone off allocation were in error. But they had one immediate effect: The three major U.S. producers were faced with a flood of orders that couldn't be filled.

What's more, non-defense users can't expect any substantial supply relief for some time yet, until supply and demand come within hailing distance. Because of its fast-growing needs in the mobilization program, the output is only about half enough. Latest NPA estimate: Demand is now 7 million pounds a month, supply on the low side of 4 million.

So Big?: This gap is even bigger now than it was at the end of August when NPA placed methylene chloride on allocation. At that time, it was figured that annual capacity amounted to 38.1 million pounds, and demand was gauged at around 44.1 million pounds. Five months have gone by and the output is still about the same, but the demand is up to a rate of 80 million pounds a year.

It would be far-fetched to expect demand to stay at this present peak level indefinitely. But it is also clear that production can't be pushed ahead with the speed producers and customers would like. This spring, one manufacturer will expand his output, and another before the end of the year. Even so, capacity will be boosted by 10 million pounds this year and another 10 million in 1953, for a total of 58 million pounds by the end of that time.

Toward Relief: Capacity increases have been limited by shortages of chlorine and—in one case at least—by lack of power. Unfilled needs for equipment have compounded the delay. But these are perhaps only part of the answer.

Without actually saying so out loud, producers are wondering how long this demand peak will last. Biggest uses are in the making of safety photographic film, paint strippers, and engine part cleaners. A lot of it has gone into "demothballing" of World War II equipment, a huge, but nonrecurring kind of use. If and when this demand tapers off, non-defense uses will get supply relief—and not until then.

GOVERNMENT NEEDS

Bid Closing	Invitation No.	Quantity	Item
Business Service Center, Region 2, General Services Administration, 250 Hudson Street, New York, N.Y.:			
Feb. 11	(NY-2B-35471)	48000 lbs	Sweeping compound
Commandant of the Marine Corps, Washington, D.C. Attn: Supply Department Procurement Section:			
Feb. 20	723B	233000 lbs	Compound, steam cleaning, alkaline mixture, powdered form, military spec MIL-C-16161/ships/.
		64950 lbs	Compound, sweening, with mineral oil base, type 1, Federal spec P-S-863
Headquarters Air Materiel Command, Dayton, Ohio:			
Feb. 11	52-546B	25 it.	Phenolic sheet
General Services Administration, 1031 So. Broadway, Los Angeles 15, California:			
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EQUIPMENT—used-surplus

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Autoclave, 1 gal., glass lined, 500# Pr., Direct fired. Perry Equip., 1415 N. 6th St., Phila. 22, Pa.

EQUIPMENT — used - surplus

For Sale

Autoclaves, Tile Lined. First Machinery Corp., 157 Hudson St., N.Y. 13, N.Y.

Calenders, New Rubber Calenders, 6x12", Johnson joints, 7½ HP motor, Complete. Eagle Industries, 110 Washington St., NYC.

Centrifugal, 36"x40", Bird, Continuous, Consolidated Products, 14-18 Park Row, N.Y. 38, N.Y.

Centrifugals, Bird Rubber Covered. First Machinery Corp., 157 Hudson St., N.Y. 13, N.Y.

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Dryer, Bower S.S. Spray 7'x8½', Complete. Equipment Clearing House, 289 10 St., Bklyn. 15.

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Dryer, Louisville Tube, 6'x50'. R. Gelb & Sons, Inc., Union, N.J.

Dryer, Vacuum Shelf, 44"x44" shelves, MD pumps, complete. Eagle Industries, 110 Washington St., NYC.

Dryers (4 Beaird 4'x27' gas-fired with blowers). Chemical & Process Machinery Corp., 146 Grand Street, New York 13, N.Y.

Dryers, Stainless Drum 5'x10'. First Machinery Corp., 157 Hudson St., N.Y. 13, N.Y.

Evaporator, Stokes, 625 gal. S/S 304 j'ktd & coiled. Chemical & Process Machinery Corp., 146 Grand Street, New York 13, N.Y.

Evaporators, Multiple Effect. First Machinery Corp., 157 Hudson St., N.Y. 13, N.Y.

Filter, Sweetland #5, 29 leaves. Perry Equip. 1415 N. 6th St., Phila. 22, Pa.

Filter, Vallez #49, 41 Stainless covered leaves 44½" dia. Stein Equipment Co., 90 West St., NYC. WOrth 2-5745.

Filters, Sweetland, up to #12. First Machinery Corp., 157 Hudson St., N.Y. 13, N.Y.

Filter Press, 24"x24", aluminum, 24 chambers, Consolidated Prods., 14-18 Park Row, N.Y. 38.

Filter Press, 30"x30", iron, Sperry, steam heated. 30 chambers, Consolidated Products. 14-18 Park Row, N.Y. 38, N.Y., Barclay 7-0600.

Filter Presses, all sizes and types. Process In-dustries, 305 Powell St., Brooklyn 12, N.Y.

Mill, New Rubber Mills, 6x12, 6x14, 6x16"; Johnson joints, Complete. Eagle Industries, 110 Washington St., N.Y.C.

Mill tube Hardinge 4'x14'6" Belgian block lined, Chemical & Process Machinery Corp., 146 Grand Street, New York 13, N.Y.

Mixer, Day Mogul, 2½ & 5 gals. R. Gelb & Sons, Inc., Union, N. J.

Mixer, Day S/S, Sigma Blades, 50 gals. R. Gelb & Sons, Inc., Union, N. J.

Mixer, Lab BP Vacuum, 17 gal, jktd, MD, Complete. Eagle Industries, 110 Washington St., NY.

Mixer, 110 gal. stainless Patterson Vacuum, Consolidated Prods., 14-18 Park Row, N.Y. 38.

Mixer, 600# Day Spiral S.S. lined, Porc. Bottom, M.D. Machinery Exch., 131 Thompson, N.Y.

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Pulverizer, Raymond High Side 5 roll, Consolidated Products, 14-18 Park Row, N.Y. 38, N.Y.

Tablet Press, Stokes DD2, 23 punch, Consolidated Products, 14-18 Park Row, N.Y. 38, N.Y.

Tank, Copper, 11,000 gal., ADME 30# Hydr. Perry Equip., 1415 N. 6th St., Phila. 22, Pa.

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EQUIPMENT — used - surplus

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BOOKS . . .

The Phosphatides, by Harold Wittcoff. Reinhold Publishing Corp., New York, N.Y.; 564 pp., $10.

Monograph reviewing the literature through 1949 and developments in the field of phosphatides from an interpretative standpoint. The editor has divided his material into sections which cover the chemical, physical, analytical, biochemical and industrial aspects individually, pointing out in each case gaps in the knowledge of phosphatides which call for further investigation and study. Also included in the scope of this book are details on nomenclature, isolation, structure proof, enzymic relationships, medical aspects, etc.

Graphic Aids in Engineering Computation, by R. P. Hoilscher, J. N. Arnold and S. H. Pierce. McGraw-Hill Book Co., New York, N.Y.; viii+197 pp., $4.50.

Elementary text covering various graphical and mechanical aids used in engineering computations, with particular stress placed on the principles and methods of operation of slide rules and the construction of alignment charts. Nomography is discussed from the basis of plane geometry with details of latest developments in the field noted in a chapter on movable-scale charts.

MEETINGS...

Technical Assn. of the Pulp & Paper Ind., annual meeting, Commodore Hotel, N.Y., Feb. 18-21.

Manuf. Chemists' Assn., air pollution abatement conf., Statler Hotel, N.Y., Feb. 25-26.

Drug, Chemical & Allied Trades Section of New York Board of Trade, annual dinner, Waldorf-Astoria Hotel, N.Y., Mar. 6.

Natl. Assn. of Corrosion Engineers, annual conf. & exhibition, Buccaneer Hotel, Galveston, Mar. 10-14.

Natl. Farm Chemurgic Council, annual conf., Statler Hotel, St. Louis, Mar. 11-12.

Soc. of Plastics Ind., Inc., national plastics exposition, Convention Hall, Phila., Mar. 11-14.

Amer. Inst. of Chem. Engineers, Atlanta Biltmore Hotel, Atlanta, Mar. 16-19.

Coml. Chem. Dev. Assn., annual open meeting, Statler Hotel, N.Y., Mar. 20.

Chicago Intl. Trade Fair, Navy Pier, Chicago, Mar. 22-April 6.

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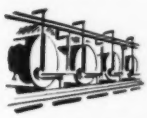

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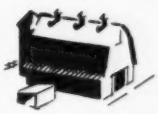

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BOOKLETS . . . . . .

Chemicals

Polyvinyl Chloride Resins

16-p. technical bulletin giving data on Geon resins, "101" and "101-EP," straight polyvinyl chloride resins designed for use in calendering, extrusion, and injection molding compounds. Discussed here are compounding ingredients —plasticizers, stabilizers, fillers, lubricants and color pigments—as well as the factors to be considered in developing a formulation. B. F. Goodrich Chemical Co., Rose Bldg., Cleveland, Ohio.

Unsaturated Alcohol

Bulletin discussing "Nopol," a high-boiling unsaturated alcohol useful as a raw material in various applications. The bulletin gives details of formula, properties, reactions and derivatives, in addition to outlining experiments in which its potentialities have been investigated. The Glidden Co., Cleveland, Ohio.

Equipment

Centrifugal Blowers

6-p. folder discusses construction features of multi-stage Type V centrifugal blowers for equivalent air pressures above 6.5 psig and inlet volumes above 1500 cfm, with the aid of pertinent cross-section photographs and diagrams. Allis-Chalmers Mfg. Co.

Panel Vent Sets

Bulletin containing illustrations, construction details, capacity ratings and dimensions of panel vent set, which affords a positive controlled ventilation for industrial and commercial buildings. American Machine and Metals, Inc.

Temperature Control

4-p. bulletin outlining details of construction and operation of temperature control, which anticipates weather changes and adjusts heat input accordingly. Sketch gives idea of how control is installed. Automatic Devices Co., Inc.

Elevating Tables

4-p. bulletin describing the firm's line of hydraulic elevating tables some of which can be used for die handling or work positioning and others for strip and sheet feeding operations. Capacities range from 2000 lbs. to 20,000 lbs. The Raymond Corp.

Laboratory Clamps

12-p. catalog covering the firm's line of clamp holders and additional laboratory items such as magnetic stirrers, electric stopwatches, electronic relay controls and carboypumps. Laboratory Industries, Inc., 4710 W. North Ave., Chicago, Ill.

Impregnating Equipment

4-p. bulletin describes and explains the construction, operation and application of vacuum pressure impregnating system and contains additional information on the impregnation of electrical equipment, metal castings, leather and textiles, lumber and other materials. Process Industries Engineers, Inc., Pittsburgh, Pa.

Mechanical Freezers

4-p. specification bulletin devoted to industrial mechanical freezers capable of holding temperatures as low as minus 165 F, finding application in metal stabilizing, metal hardening, storage (in biological laboratories), testing instruments and materials at extremely low temperatures, etc. Webber Appliance Co., Inc., 2740 Madison Ave., Indianapolis, Ind.

Gases Conversion Chart

Calendar intended for those interested in low-temperature research, particularly in the liquid helium temperature range, carries boiling points of gases conversion chart, which lists gases by boiling point in centigrade, fahrenheit and absolute scales. Arthur D. Little, Inc., 30 Memorial Drive, Cambridge, Mass.

Boiler-Feed Water Treatment

4-p. folder treats ionXchange equipment such as softeners, hydrogen-zeolite, deionizers and other equipment—for producing a solids-free, silica-free water for power plant requirements. Illinois Water Treatment Co., Rockford, Ill.

Arc Furnace Electrical Equipment

20-p. booklet explaining the application of electrical equipment—the Optimelt arc furnace control, circuit breakers, transformers, regulators and control panels—to both direct and submerged arc furnaces, for applications in steel mills, chemical plants, foundries and nonferrous metal refineries. Westinghouse Electric Corp.

ADVERTISER'S INDEX

CHEMICAL WEEK • FEBRUARY 9, 1952

AMERICAN CYANAMID CO. 9
Agency—Hazard Advertising Co.
AMERICAN FLANGE & MFG. CO., INC. 2
Agency—Freiwald & Coleman Advertising
AMERICAN MAT CORP. 28
Agency—Wendt Advertising Agency
ANTARA CHEMICALS, A DIVISION OF GENERAL DYESTUFF CORP. 27
Agency—J. Hayden Twiss, Advertising
ARCHER, DANIELS, MIDLAND CO. 32
Agency—The Bayless-Kerr Co.
BARRETT DIVISION, ALLIED CHEMICAL & DYE CORP. 48
Agency—McCann-Erickson, Inc.
BUFFALO FORGE CO. 30
Agency—Melvin F. Hall Advertising Agency
CARBIDE & CARBON CHEMICALS CO., A DIVISION OF UNION CARBIDE & CARBON CORP. ..... Back Cover
Agency—J. M. Mathes, Inc.
CARLISLE CHEMICAL WORKS, INC. B16
CHEMICAL CORP., THE 22
Agency—Wm. R. Remington, Inc.
CHEW, INC., JOHN A. 18
Agency—J. Hayden Twiss, Advertising
COLUMBIA-SOUTHERN CHEMICAL CORP. 17
Agency—Ketchum, MacLeod & Grove, Inc.
COOK ASSOCIATES, INC., W. MILLER T16
Agency—Irving L. Braun, Advertising
DODGE & OLCOTT, INC. 46
Agency—Peck Advertising Agency, Inc.
DOW CHEMICAL CO., THE 37
Agency—MacManus, John & Adams, Inc.
DOW CORNING CORP. 35
Agency—Don Wagnitz, Advertising
DU PONT DE NEMOURS & CO., INC., KINETIC CHEMICALS DIVISION 42-43
Agency—Batten, Barton, Durstine & Osborn, Inc.
EIMCO CORP., THE 1
Agency—Matile Co.
EL DORADO OIL WORKS 3
Agency—Sidney Garfield & Associates
EMERY INDUSTRIES, INC. 41
Agency—Ruthrauff & Ryan, Inc.
FINE ORGANICS, INC. T40
Agency—Sid N. Cottin, Advertising
FRITZSCHE BROTHERS, INC. B21
GOODYEAR CHEMICAL DIVISION 31
Agency—Kudner Agency
HARDINGE CO., INC. T38
Agency—The W. H. Long Co.
HARSHAW CHEMICAL CO., THE 55
HERCULES POWDER CO. 6
Agency—Fuller & Smith & Ross, Inc.
INTERNATIONAL MINERALS & CHEMICAL CORP. 29
Agency—C. Franklin Brown, Inc.
KESSLER CHEMICAL CO., INC. T54
Agency—Sommers-Davis, Inc.
KRAFT BAG CORP. 20
Agency—Arthur A. Judson, Inc.
LUCIDOL DIVISION, NOVADEL-AGENE CORP. B38
McGRAW-HILL BOOK CO., INC. 47
McKESSON & ROBBINS, INC. B54
Agency—Bloberne Advertising Co.
MERCOID CORP., THE T21
MOORE & MUNGER 23
Agency—Asher, Godfrey & Franklin, Inc.
NATIONAL CARBON CO., A DIVISION OF UNION CARBIDE & CARBON CORP. 44
Agency—William Esty Co., Inc.
NATIONAL STARCH PRODUCTS, INC. 33
Agency—G. M. Basford Co.
NIAGARA ALKALI CO. 25
Agency—Hazard Advertising Co.
ORONITE CHEMICAL CO. 19
Agency—L. C. Cole Company
PELAMAY PRODUCTS T45
Agency—Diener & Dorskind, Inc.
PHILIPP BROTHERS, INC., METALS & CHEMICALS 4
Agency—Arlington Advertising Agency
POTDEVIN MACHINE CO. B45
Agency—S. Bass & Co., Inc.
REICHHOLD CHEMICALS, INC. ..... 3rd Cover
Agency—MacManus, John & Adams, Inc.
SHELL CHEMICAL CORP. 15
Agency—J. Walter Thompson Co.
SLY MFG. CO., W. W. 34
Agency—The Bayless-Kerr Co.
SONNEBORN SONS, INC., L. 10
Agency—Hicks & Greist, Inc.
TENNESSEE EASTMAN CO., A DIVISION OF EASTMAN KODAK CO. 39
Agency—Kenyon & Eckhardt, Inc.
TITLESTAD CORP., NICOLAY 26
Agency—Richard La Fond Advertising
UNION CARBIDE & CARBON CORP., CARBIDE & CARBON CHEMICAL CORP. ..... Back Cover
Agency—J. M. Mathes, Inc.
VELSICOL CORP. 5
Agency—E. Ross Humphrey, Advertising
WESTVACO CHEMICAL DIVISION, FOOD MACHINERY & CHEMICAL CORP. ..... 2nd Cover
Agency—James J. McMahon, Inc.
WIEGAND CO., EDWIN L. 36
Agency—Smith, Taylor & Jenkins, Inc.
WILLSON PRODUCTS, INC. 24
Agency—Beaumont, Heller & Sperling, Inc.
WINTHROP-STEARNS, INC. B40
Agency—Robert W. Rodman, Advertising

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Union Carbide and Carbon Corporation
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Offices in Principal Cities
In Canada:
Carbide and Carbon Chemicals, Limited, Toronto